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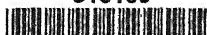
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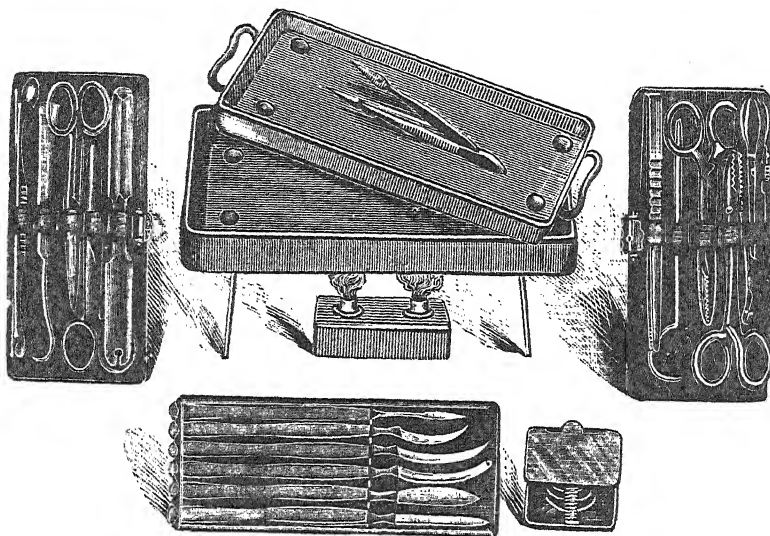
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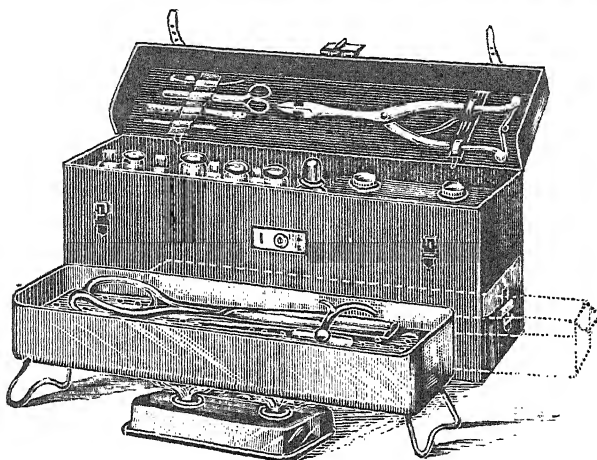
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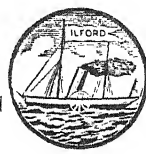
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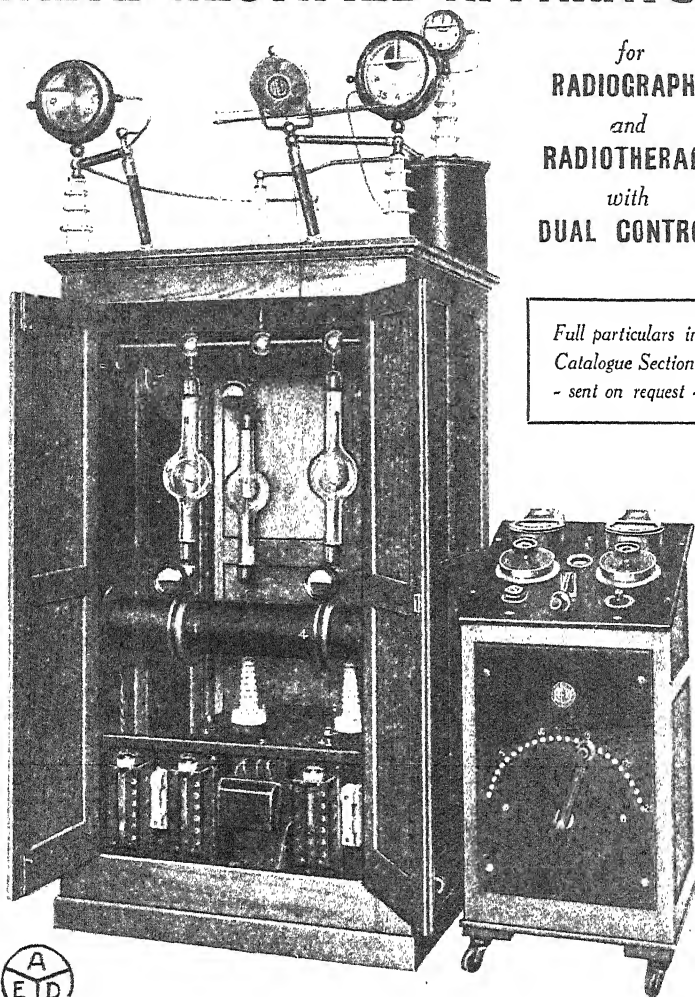
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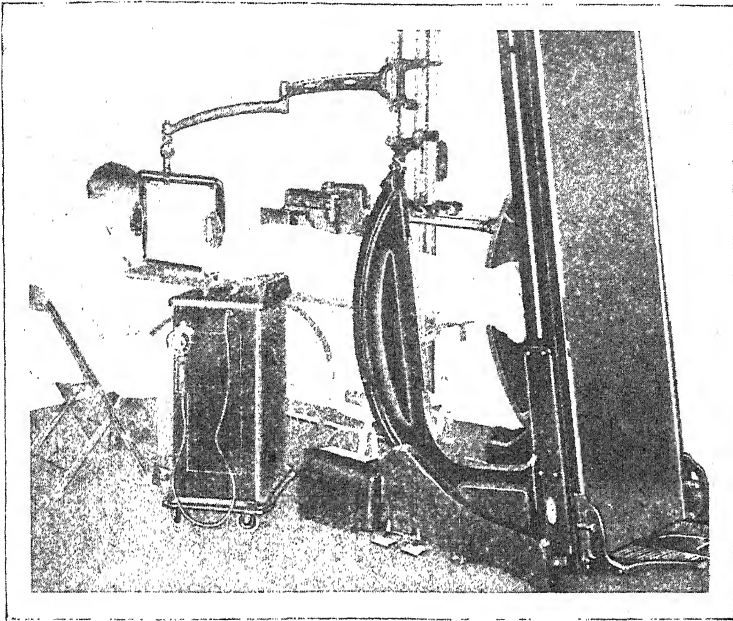
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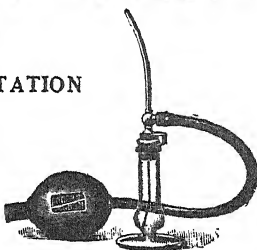
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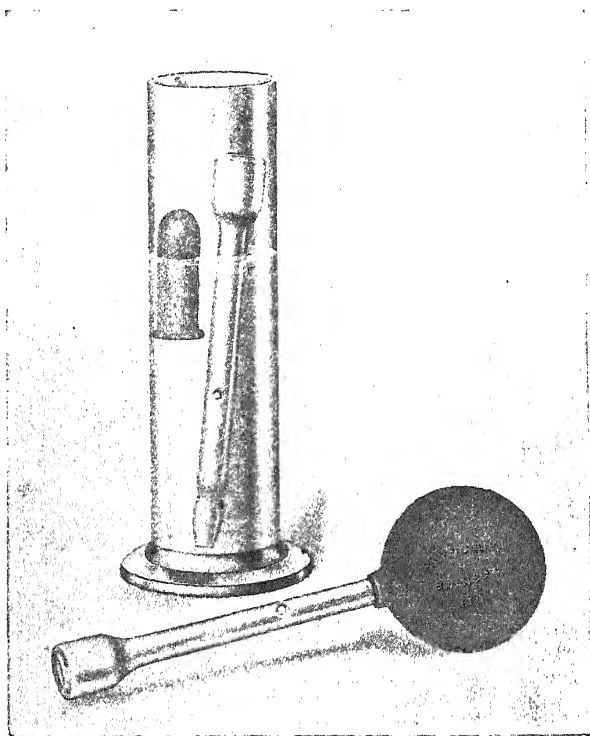
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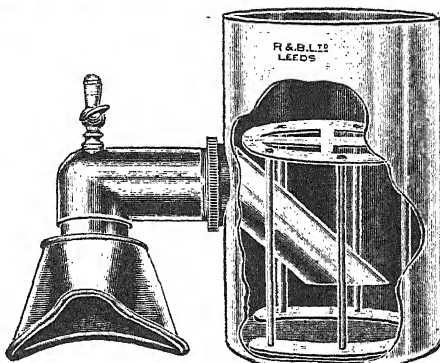
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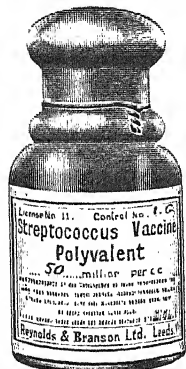
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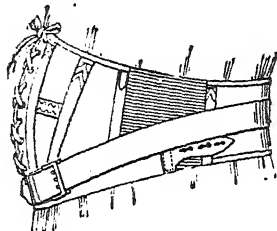
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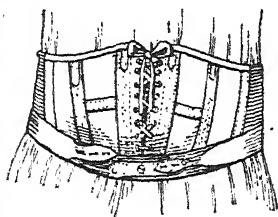
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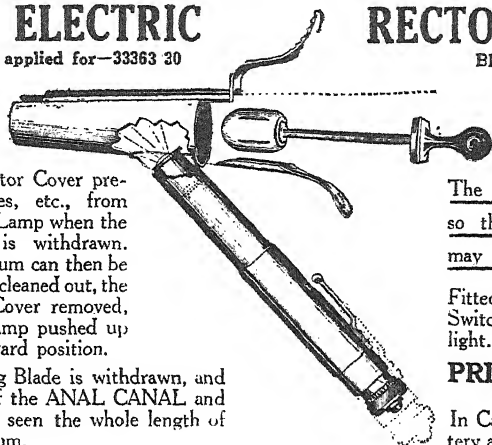
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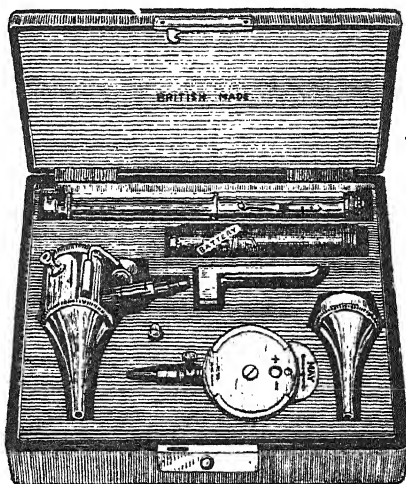
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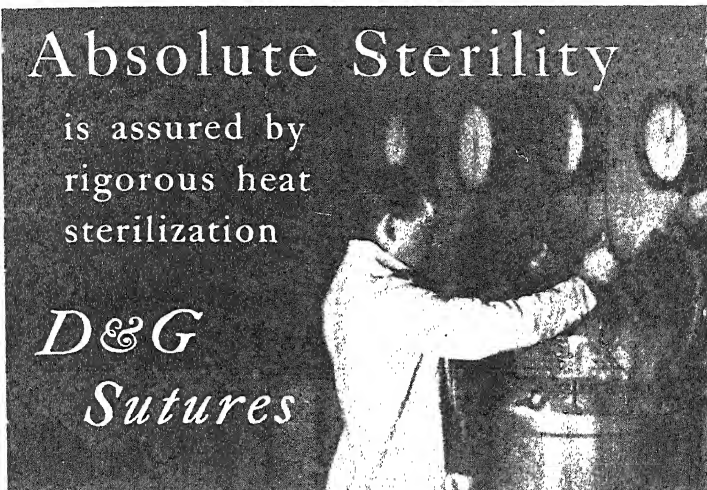
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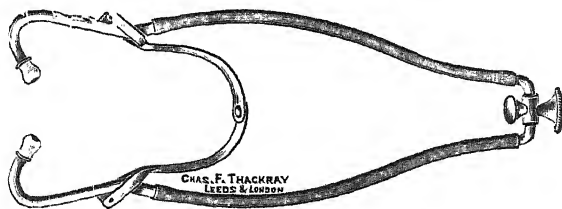


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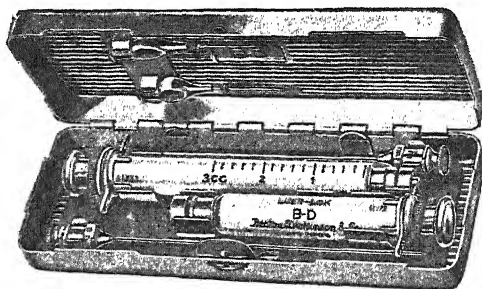
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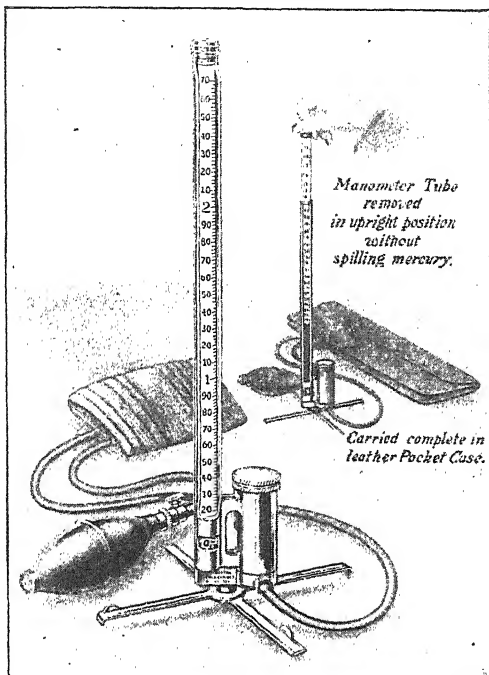
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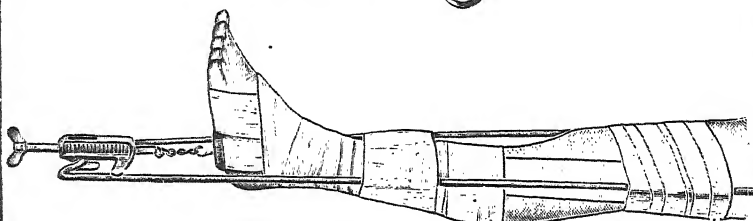
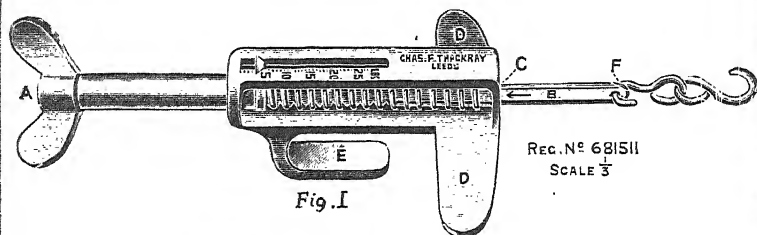
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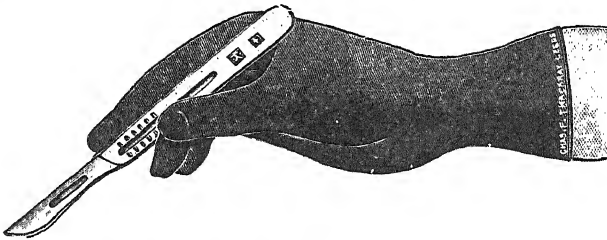
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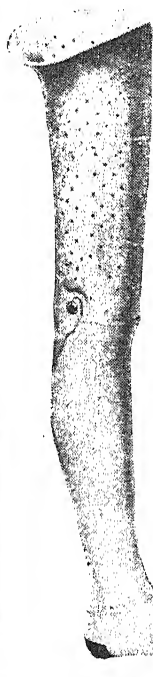
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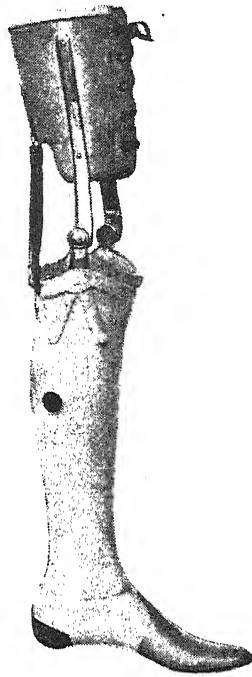
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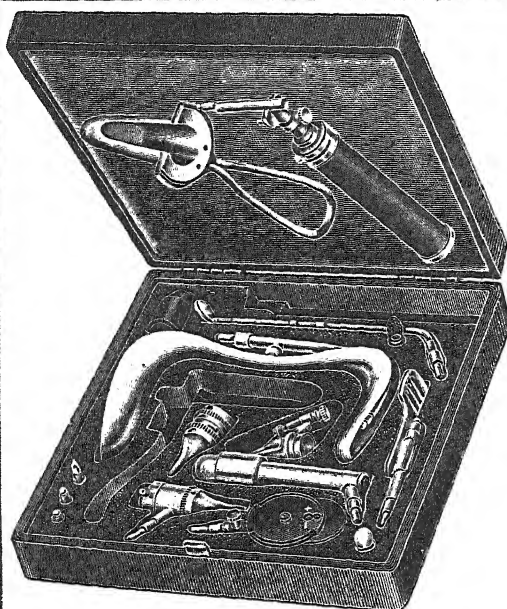
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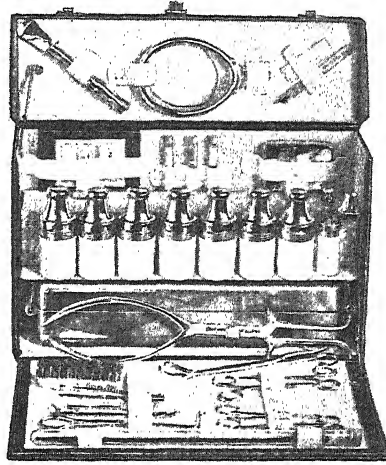
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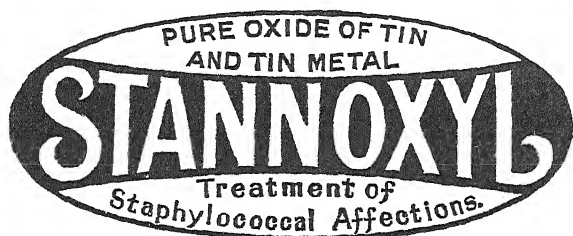
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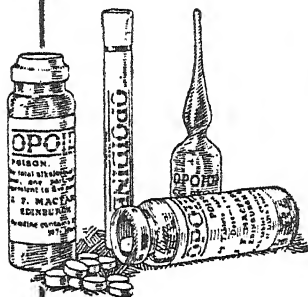
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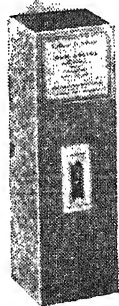
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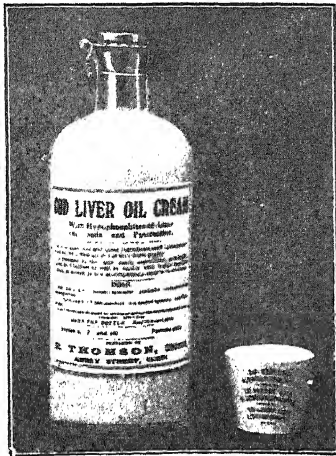
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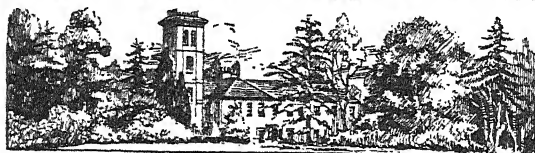
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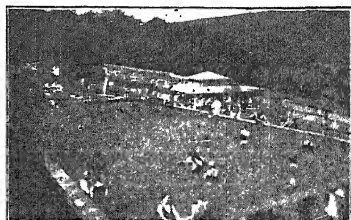
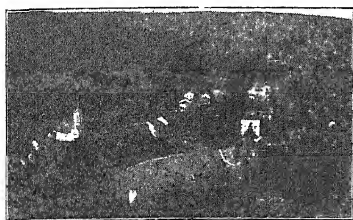
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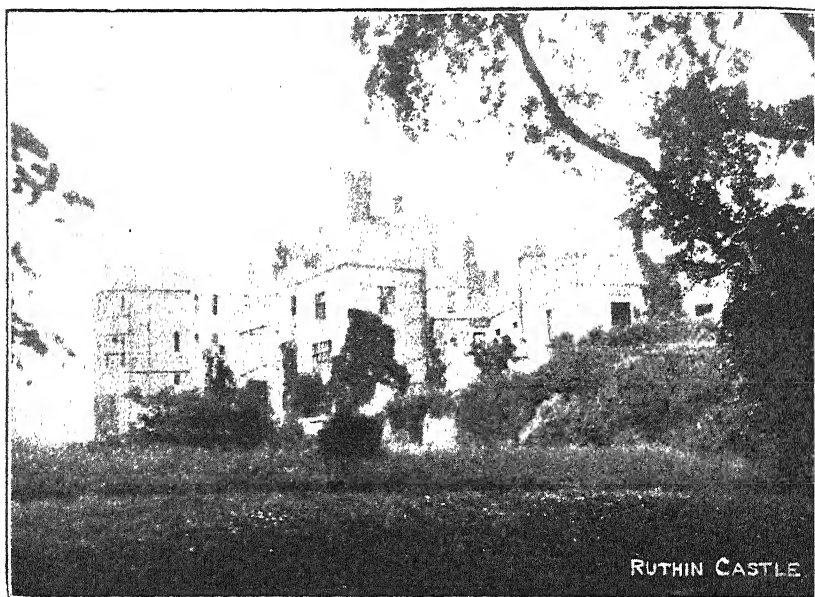
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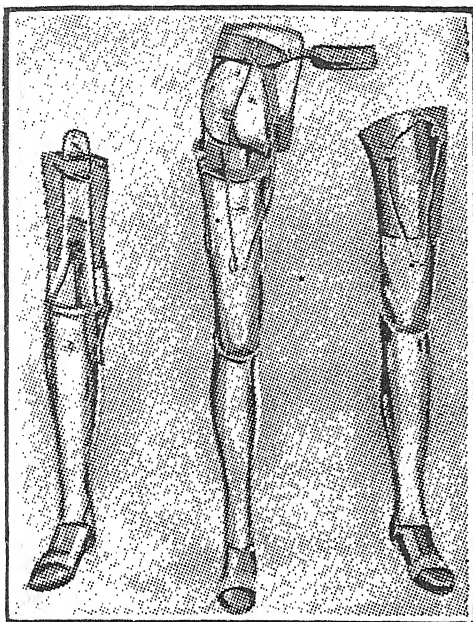
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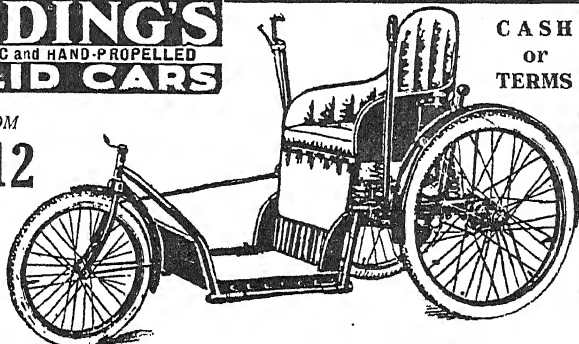
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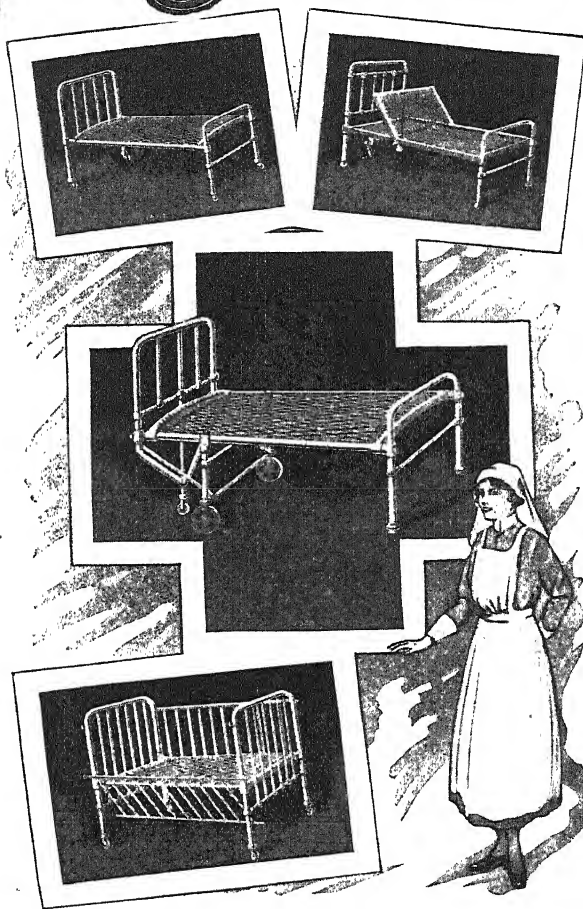
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THE MEDICAL ANNUAL:

A YEAR BOOK OF TREATMENT AND PRACTITIONER'S INDEX

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Contents

| | PAGE |
|---|-------------|
| CONTRIBUTORS AND LIST OF SUBJECTS | Ixiv-lxviii |
| LIST OF PLATES AND ILLUSTRATIONS | lix-lxx |
| GENERAL INDEX | lxxi-xcix |

A REVIEW OF THE YEAR'S WORK IN THE TREATMENT OF DISEASE.

| | |
|--|-------|
| INTRODUCTION, BY THE EDITORS | 1-8 |
| DICTIONARY OF PRACTICAL MEDICINE, BY MANY CONTRIBUTORS | 9-523 |

MISCELLANEOUS.

| | |
|---|---------|
| THE PRACTITIONER'S INDEX—NEW INVENTIONS AND PREPARATIONS | 524-553 |
| BOOKS OF THE YEAR | 554-565 |
| ESTABLISHMENTS FOR THE TREATMENT OF MENTAL DISEASE | 566-573 |
| INSTITUTIONS UNDER THE MENTAL DEFICIENCY ACT, 1913 | 573-576 |
| INSTITUTIONS FOR INEBRIATES | 576 |
| SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS | 577-580 |
| HYDROPATHIC ESTABLISHMENTS | 580-581 |
| NURSING INSTITUTIONS | 581 |
| PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, ETC. | 581-582 |
| PRINCIPAL BRITISH SPAS | 582-585 |
| OFFICIAL DIRECTORY | 586-587 |
| MEDICAL AND SCIENTIFIC SOCIETIES AND PERIODICALS | 588-591 |
| MEDICAL TRADES DIRECTORY | 592-594 |
| NOTE BOOK, CALENDAR, AND POSTAL INFORMATION | 595-603 |
| INDEX TO ADVERTISEMENTS | I |
| LIFE ASSURANCE OFFICES, LIST OF | 15 |

Contributors and Original Contributions to The Medical Annual, 1931

JOSEPH BLOMFIELD, O.B.E., B.A., M.D.Camb., Consulting Anaesthetist and Lecturer on Anaesthetics, St. George's Hospital. (*Anæsthesia.*)

Anæsthesia—30.

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Endocrine Tumours—175. Ovarian Hormones—342. Parathyroid Glands—345. Pituitary Gland—357. Suprarenal Glands—150. Thyroid Gland—466.

STANFORD CADE, F.R.C.S., Assistant Surgeon, Westminster Hospital; Surgeon, Mount Vernon Hospital; Consulting Surgeon, Bethlem Royal Hospital. (*Radium Treatment of Cancer.*)

Radium Treatment of Cancer—396.

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Diabetes—140.

L. E. CLAREMONT, M.D.S., L.D.S., R.C.S., M.R.C.S., L.R.C.P., Director, Eastman Dental Clinic, Royal Free Hospital, London. (*Dental Surgery.*)

Dental Caries and Pyorrhea Alveolaris, Etiology of—126. Dental Sepsis—131. Dentistry, Children's—134. Dentistry, Radiography in—136. Dentistry and Radium—138. Gingivitis, Hypertrophic—216. Oral Surgery—339.

MACDONALD CRITCHLEY, M.D., F.R.C.P., Junior Neurologist and Lecturer in Neurology, Therapeutics, and Applied Pharmacology, King's College Hospital; Assistant Physician, National Hospital, Queen Square.

(*Diseases of the Nervous System.*)

Auditory Imperception, Congenital—60. Cerebrospinal Fluid—88. Dementia Paralytica—124. Epidemic Encephalitis and Pregnancy—172. Epilepsy—177. Lindau's Disease—280. Poliomyelitis—369. Tabes Dorsalis—460.

IVOR J. DAVIES, M.D., F.R.C.P., Hon. Assistant Physician, Royal Infirmary, Cardiff; Examiner in Medicine to the Conjoint Board, London; Associate Examiner in Medicine to the University of London; etc.

(*General Medicine.*)

Anæmia, Pernicious—19. Anæmia, Secondary—27. Coccidioid Granuloma—100. Dyspepsia—159. Erythema Nodosum—182. Erythræmia—182. Hæmophilia—226. Jaundice, Hæmolytic—251. Leukæmia—278. Lipodystrophy—284. Lymphoma—302. Pharmacology and General Therapeutics—352. Pyogenic Infections—392. Renal Disease—403. Rheumatism and Arthritis—414.

HENRY DEVINE, O.B.E., M.D., F.R.C.P., Medical Superintendent, Holloway Sanatorium, Virginia Water, Surrey; Lecturer on Psychology, Maudsley Hospital.
(*Mental Diseases and Psychological Medicine.*)

Alcohol and Drug Addiction—10. Anorexia Nervosa—45. Dementia Præcox—125. Eugenic Sterilization—183. Mental Deficiency—308. Mental Depression, Types of—312. Mental Diseases—314. Mental and Nervous Sequelæ of Trauma—320.

W. S. DUKE-ELDER, M.A., D.Sc., Ph.D., M.D., F.R.C.S., Ophthalmic Surgeon and Lecturer in Ophthalmology, St. George's Hospital; Surgeon and Physiotherapist, Royal London Ophthalmic Hospital. (*Eye Diseases.*)

Conjunctiva, Diseases of—107. Cornea, Diseases of—114. Eye Affections—185. Glaucoma—218. Retinal Detachment—411.

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Empyema—169. Heart and Pericardium, Surgery of—233. Lung, Abscess of—289. Lung and Mediastinum: Mediastinal Dermoids—298. Tuberculosis, Pulmonary, Surgical Treatment—481.

JOHN FRASER, M.C., M.D., F.R.C.S.E., Hon. Surgeon to H.M. the King in Scotland; Regius Professor of Clinical Surgery, University of Edinburgh; Consulting Surgeon, Royal Hospital for Sick Children, Edinburgh.

(*Surgical Diseases of Children.*)

Appendicitis and Peritonitis in Children—47. Foot, Surgery of—192. Harelip and Cleft Palate—228. Osteomyelitis—342. Pylorus, Congenital Stenosis of—391. Rectum, Prolapse of—400. Spina Bifida—437. Tuberculosis, Surgical—483.

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(*Diseases of the Heart and Blood-vessels.*)

Angina Pectoris and Coronary Artery Disease—38. Arrhythmia and Electrocardiography—49. Arteries, Diseases of—52. Blood-pressure, Continuous Registration of—72. Blood-pressure, High—72. Embolism, Paradoxical—168. Endocarditis, Subacute Infective—174. Heart, Action of Drugs upon—229. Heart Disease, Congenital—230. Heart Disease, Syphilitic—231. Heart, Estimation of Efficiency of—232. Heart Failure—233. Heart in Relation to Surgical Operations—235. Heart, X-ray Appearances—235. Mitral Stenosis—324. Pericarditis, Tuberculous—351. Pericardium, Calcification of—351.

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(*Skin Diseases.*)

Erythema—180. Herpes Zoster—240. Lupus Erythematosus—300. Lupus Vulgaris—300. Nævus—324. Pityriasis Folliculorum—363. Pityriasis Lichenoides et Varioliformis Acuta—364. Skin, Discoloration of—426. Skin Diseases, Blood Chemistry in—427. Skin, Fungous Infections of—428. Skin, Pyogenic Infections of—432. Skin Sensitization in Dermatitis and Eczema—432. Ulcers—495. Xanthoma—510.

ERNEST W. HEY GROVES, M.S., M.D., F.R.C.S., Professor of Surgery, University of Bristol; Surgeon, Bristol General Hospital; Member of the Court of Examiners, Royal College of Surgeons, England; Examiner in Surgery, London, Leeds, Liverpool, Manchester, and Sheffield Universities, and National University of Ireland.
(*Orthopedic Surgery.*)

Bones, Long, Tumours of—74. Fractures—194. Spine, Injuries of—441. Tendon and Tendon-sheaths, Injuries and Diseases of—462. Tuberculosis, Surgical—487.

L. W. HARRISON, D.S.O., M.B., Ch.B. Glasg., F.R.C.P. Edin., Brevet-Col. R.A.M.C., and King's Honorary Physician (Ret.); Special Medical Officer for Venereal Diseases, Ministry of Health; Lecturer in Venereal Diseases and Director of Venereal Diseases Department, St. Thomas's Hospital.
(*Venereal Diseases.*)

Chancroid—92. Gonorrhoea—220. Syphilis—452.

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(*Radiotherapy and X-ray Diagnosis.*)

Diatlhermy—150. Phototherapy—355. X-ray Diagnosis—510. X-ray Therapy—521.

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(*Gastro-intestinal Disorders.*)

Colitis, Ulcerative—101. Colon, Multiple Polyposis of—105. Constipation—111. Diverticulitis—155. Gastric Analysis—208. Gastric and Duodenal Ulcer—209. Liver, Diseases of—284. Liver Efficiency Tests—285. Psittacosis—357. Rumination—420. Visceroptosis—508.

GEOFFREY JEFFERSON, M.S., F.R.C.S., Hon. Neurological Surgeon, Manchester Royal Infirmary; Hon. Surgeon, Salford Royal Hospital; Lecturer in Applied Anatomy (Neurological), University of Manchester.
(*Surgery of the Nervous System.*)

Brain, Tumours of—75. Facial Paralysis—185. Intracranial Hæmorrhage—247. Nasopharynx, Endothelioma of—326. Neuralgia, Trigeminal—329. Pituitary Tumours—362. Torticollis, Spasmodic—172. Tuberculosis of the Central Nervous System—475.

J. P. LOCKHART-MUMMERY, M.A., M.B., B.Ch., F.R.C.S. Eng., Senior Surgeon, St. Mark's Hospital; Consulting Surgeon, Queen's Hospital for Children, Hackney.
(*Rectal Surgery.*)

Anus and Rectum, Prolapse of—46. Hæmorrhoids—226. Ischiorectal Abscess—249. Pruritus Ani et Vulvæ—387. Rectum, Cancer of—398. Rectum and Sigmoid, Stercoliths of—402.

REGINALD MILLER, M.D., F.R.C.P., Senior Physician, Paddington Green Children's Hospital; Physician, St. Mary's Hospital; Lecturer in Children's Diseases, St. Mary's Hospital Medical School.

(*Medical Diseases of Children.*)

Anæmia in Infants and Children: Liver Therapy—18. Anorexia, Congenital—43. Asthma in Children—56. Children, Intraperitoneal Therapy in—95. Chorea—98. Gaucher's Splenomegaly in Infancy—216. Hereditary Ectodermal Dysplasia—237. Hyperpyrexia in Early Infancy due to Atropine—241. Juvenile Infections, Diathesis in—252. New-born, Hæmoglobinuria in—330. Rickets—419.

GEOFFREY E. OATES, M.D., M.R.C.P., D.P.H., Barrister-at-Law ; Medical Officer of Health for the Metropolitan Borough of Paddington.
(*Public Health and Forensic Medicine.*)

Coroners' Cases and Medico-legal Work—122. Epidemic Enteritis—177. Food and the Public Health—190. Industrial Diseases—242. Infection from Books—244. Legal Decisions, Recent—276. Nursing Homes, Inspection and Registration of—335. Scarlet Fever, Management of—424. Swimming Baths and the Public Health—451.

SIR LEONARD ROGERS, C.I.E., M.D., F.R.C.P., F.R.F.P. & S. Glasg., F.R.C.S., F.R.S., Major-Gen. I.M.S. (Ret.), Physician and Lecturer, London School of Tropical Medicine ; late Professor of Pathology, Medical College, Calcutta.
(*Tropical Diseases.*)

Amœbiasis—16. Ankylostomiasis—43. Beri-beri—62. Blackwater Fever—63. Cholera—96. Dengue—126. Dysentery, Bacillary—158. Filariasis—188. Kala-azar—254. Leprosy—277. Malaria—303. Pellagra—349. Plague—364. Schistosomiasis—425. Sprue—446. Trypanosomiasis—474. Undulant Fever—496. Yaws—522. Yellow Fever—523.

JOHN D. ROLLESTON, M.A., M.D.Oxon., M.R.C.P.Lond., Medical Superintendent, Western Fever Hospital, London.
(*Acute Infectious Diseases.*)

Cerebrospinal Fever—87. Chicken-pox—94. Diphtheria—151. Encephalitis, Epidemic—171. Erysipelas—179. Erythema Infectiosum—181. Exanthema Subitum—184. Glanders—217. Glandular Fever—217. Influenza—245. Jaundice, Infective—251. Measles—307. Mumps—324. Paratyphoid Fevers—348. Rubella—420. Scarlet Fever—421. Small-pox—436. Staphylococcal Infections—448. Trichinosis—474. Tularemia—489. Typhoid Fever—490. Typhus Fever—494. Vaccination—501. Whooping-cough—509.

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(*Abdominal Surgery.*)

Abdominal Surgery, Miscellaneous—9. Appendicitis—46. Colon, Surgery of—106. Gall-bladder, Surgery of—203. Gastric and Duodenal Ulcer, Surgery of—209. Hernia—238. Intestinal Obstruction—246. Intestines, Surgical Affections of—247. Liver, Surgery of—286. Lymphadenitis, Mesenteric—301. Pancreas, Surgery of—344. Peritonitis, Tuberculous—352. Spleen, Surgical Affections of—445. Stomach, Surgical Diseases of—448. Subphrenic Abscess—450. Tongue, Tuberculous Ulcers of—469.

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Bladder, Surgery of—63. Kidney, Surgical Affections of—257. Penis, Cancer of—350. Prostate, Diseases of—381. Seminal Vesicles, Surgery of—426. Testicle and Scrotum, Diseases of—463. Ureter, Diseases of—498. Urethra, Rupture of—500.

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(*General Surgery.*)

Blood- and Lymph-vessels, Surgery of—69. Breast, Fat Necrosis of—79. Breast, Tumours of—79. Burns—85. Elephantiasis of the Lower Extremities—167. Fascial Grafts—187. Finger-nails, Split—189. Foreign Bodies in the Oesophagus and Bronchi—193. Gas Gangrene—207. Gout—219.

Hæmatoma, Spontaneous, of the Rectus Abdominis—225. Hallux Rigidus and Valgus—227. Heels, Painful—236. Illumination and Transillumination—241. Kidney, Calcification of—256. Knee-joint, Loose Bodies in—268. Lip, Cancer of—288. Neck, Cystic Tumours in—328. Nipple, Paget's Disease of—331. Pigmentation from Bismuth Absorption after the Use of B.I.P.P.—356. Pre- and Post-operative Treatment—374. Renal Rickets—409. Skin-grafting—434. Thrombo-angitis Obliterans—465. Varicose Veins—504. Visceral Decompression—507.

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(*Gynæcology and Obstetrics.*)

Labour and its Complications—268. Pregnancy and its Disorders—371. Puerperium, Disorders of—389. Radium in Gynæcology—394. Uterus: Chronic Cervicitis—500.

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(*Ear, Nose, and Throat Diseases.*)

Deafness—123. Ear, Diseases of—160. Larynx, Diseases of—273. Nasal Sinuses, Diseases of—325. Nose, Diseases of—331. Oesophagus, Diseases of—337. Otosclerosis—342. Pharynx, Diseases of—354. Tonsils, Diseases of—470. Trachea, Diseases of—473.

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(*Diseases of the Respiratory Tract.*)

Asbestosis, Pulmonary—54. Asthma and Hay Fever—57. Bronchiectasis—83. Lung, Abscess of—287. Lung, Aputrid Necrosis of—290. Lung, Massive Collapse of—291. Lung and Mediastinum, Tumours of—293. Pleurisy—365. Pneumonia—367. Tuberculosis, Pulmonary—476.

List of Illustrations

PLATES

| | PAGE |
|--|---------|
| PLATE I.—Creeping local anaesthesia - - - - - | 9 |
| PLATES II, III.—Implantation of ureters into bowel (<i>coloured and skiagram</i>) - - | 64-65 |
| PLATES IV, V.—Plasma-celled myeloma of femur (<i>skiagram</i>) - - - - - | 74-75 |
| PLATES VI, VII.—Atelectatic bronchiectasis (<i>skiagrams</i>) - - - - - | 84-85 |
| PLATE VIII.—Multiple polyposis of colon (<i>skiagrams</i>) - - - - - | 105 |
| PLATE IX.—Dental radiography (<i>skiagrams</i>) - - - - - | 138 |
| PLATE X.—Dentistry and radium - - - - - | 139 |
| PLATE XI.—Elephantiasis - - - - - | 168 |
| PLATE XII.—Foreign body in oesophagus (<i>skiagram</i>) - - - - - | 193 |
| PLATES XIII, XIV.—Fracture of the neck of the femur (<i>skiagrams</i>) - | 198-199 |
| PLATE XV.—Fracture of the heel bone - - - - - | 202 |
| PLATE XVI.—Visualization of bile-passages (<i>skiagrams</i>) - - - - - | 204 |
| PLATE XVII.—Reconstruction of common bile-duct - - - - - | 205 |
| PLATE XVIII.—Abdominal adhesions due to gonococcal infection - - - | 223 |
| PLATE XIX.—Cleft palate - - - - - | 229 |
| PLATES XX, XXI.—Inguinal hernia (<i>coloured</i>) - - - - - | 238-239 |
| PLATE XXII.—Calcification of the kidney (<i>skiagram</i>) - - - - - | 256 |
| PLATE XXIII.—Loose body in knee-joint (<i>coloured</i>) - - - - - | 268 |
| PLATE XXIV.—Epithelioma of the vocal cord - - - - - | 276 |
| PLATES XXV-XXVIII.—Lindau's disease (<i>one coloured</i>) - - - - - | 282-283 |
| PLATES XXIX, XXX.—Aputrid necrosis of lung (<i>two skiagrams</i>) - - - | 290-291 |
| PLATE XXXI.—New growth occupying the root of lung and surrounding the main bronchus - - - - - | 296 |
| PLATES XXXII, XXXIII.—Carcinoma of left lung (<i>skiagrams</i>) - - - - | 296 |
| PLATE XXXIV.—Mediastinal dermoid (<i>skiagram</i>) - - - - - | 296 |
| PLATE XXXV.—Double hydatid of lung (<i>skiagram</i>) - - - - - | 296 |
| PLATE XXXVI.—Aesthetics and mental deficiency - - - - - | 311 |
| PLATE XXXVII.—Malignant endothelioma of the neck - - - - - | 328 |
| PLATE XXXVIII.—Treatment of nasal deformity - - - - - | 332 |
| PLATE XXXIX.—Rhino-perioridosis (<i>coloured</i>) - - - - - | 335 |
| PLATES XL, XLI.—Carcinoma of oesophagus (<i>skiagrams</i>) - - - - - | 338-339 |
| PLATE XLII.—Oral surgery. Fixation in fractures of mandible - - - | 340 |
| PLATES XLIII, XLIV.—Pigmentation from bismuth absorption after the use of B.I.P.P. (<i>skiagrams and coloured</i>) - - - - - | 356-357 |
| PLATE XLV.—Pityriasis lichenoides et varioliformis acuta - - - - - | 364 |
| PLATE XLVI.—Congenital stenosis of pylorus - - - - - | 391 |
| PLATES XLVII, XLVIII.—Radium treatment of cancer (<i>one coloured</i>) - | 396-397 |
| PLATE XLIX.—Carcinoma of the rectum (<i>coloured</i>) - - - - - | 399 |
| PLATE L.—Ronal rickets (<i>two skiagrams</i>) - - - - - | 410 |
| PLATES LI, LII.—Spina bifida - - - - - | 438 |
| PLATES LIII-LVI.—Demonstration of sac contents in spina bifida (<i>three skiagrams</i>) - - - - - | 438 |
| PLATE LVII.—Bed-frame for spinal cases - - - - - | 444 |
| PLATE LVIII.—Calcification of the intervertebral discs (<i>skiagram</i>) - - | 445 |

| | PAGE |
|---|---------|
| PLATE LIX.—Rupture of tendons of hand - - - - | 462 |
| PLATE LX.—Tuberculous ulcer of tongue (<i>coloured</i>) - - - - | 469 |
| PLATE LXI.—Tonsillomycosis - - - - | 470 |
| PLATE LXII.—Encephalography (<i>skiagram</i>) - - - - | 516 |
| PLATE LXIII.—Pneumopyopericardium (<i>skiagrams</i>) - - - - | 516 |
| PLATE LXIV, LXV.—Calcification of pericardium (<i>skiagrams</i>) - - - - | 516-517 |
| PLATES LXVI-LXVIII.—Radiography of the kidneys (<i>skiagrams</i>) - - - - | 518 |
| PLATES LXIX, LXX.—Osteo-arthritis of hip (<i>skiagrams</i>) - - - - | 520-521 |

ILLUSTRATIONS

| FIGS. | PAGE |
|--|---------|
| 1.—Flow-meter for administration of gas and oxygen - - - - | 36 |
| 2.—Apparatus for intravenous administration of alcohol - - - - | 37 |
| 3-7.—'Curious' asbestosis bodies found in the lungs - - - - | 55 |
| 8.—Diagrammatic representation of spectra of a series of pathological and normal cerebrospinal fluids as shown by ultra-violet light - - - - | 90 |
| 9-14.—Instrument for, and method of use in, cutting strips of fascia lata - - - - | 187 |
| 15.—Showing method of procedure in treating split finger-nails - - - - | 189 |
| 16, 17.—Apparatus for Kirschner's method of skeletal traction - - - - | 195 |
| 18.—Ord's traction apparatus for fractures - - - - | 196 |
| 19, 20.—R. Soutter's universal portable traction appliance - - - - | 196 |
| 21, 22.—Fractures of the pelvis - - - - | 197 |
| 23-25.—Pegging operation for fracture of neck of femur - - - - | 199 |
| 26-28.—Reconstructive operation for ununited fracture of neck of femur - - - - | 200 |
| 29-31.—Repair of fracture of patella by living sutures of fascia lata - - - - | 201 |
| 32-35.—Hæmostatic clamps and special breathing tube for hare-lip operations - - - - | 228 |
| 36.—Painful points on heel due to ill-fitting shoes - - - - | 236 |
| 37, 38.—Reefing operation for divarication of the recti abdominis muscles - - - - | 240 |
| 39.—Solid angiomatous cyst directly over mid-brain, as seen at operation - - - - | 281 |
| 40.—Renal tumour associated with Lindau's disease - - - - | 282 |
| 41.—Spirogram of respiratory volume at the end of appendectomy - - - - | 293 |
| 42.—Graph showing the percentage relation of primary carcinoma of the lung to all carcinomas - - - - | 293 |
| 43.—Instruments for introducing radon seeds in carcinoma of the œsophagus - - - - | 338 |
| 44-48.—Horbury's method of sphincteric plecting for prolapse of the rectum - - - - | 401 |
| 49.—Method of locating the meridian of the hole in retinal detachment - - - - | 412 |
| 50, 51.—Skin-grafting: cutting of 'sieve graft' - - - - | 434 |
| 52.—Diagrammatic representation of varieties of spina bifida of the meningocele type - - - - | 437 |
| 53.—Steps in manipulation to reduce left-sided dislocation between cervical vertebrae - - - - | 443 |
| 54-143.—Illustrating recent medical and surgical appliances - - - - | 526-553 |

General Index:

The more important articles are in heavy type.

| | PAGE |
|---|------------|
| A.B.A. solution subcutaneously in pruritus | 524 |
| and et vulva | 387 |
| Abdominal adhesions | 9 |
| — due to gonococcal infections | 223 |
| — aorta, non-syphilitic lesions of | 52 |
| — apoplexies | 226 |
| — forceps, Miles's (<i>Fig. 72</i>) | 535 |
| — injuries in children, statistics | 9 |
| — operations, embolism and | 378 |
| — respiratory mechanism and | 379 |
| — pads, Buist's, for occipito-posterior presentations | 270 |
| — retractor (<i>Fig. 55</i>) | 530 |
| — scissors (<i>Fig. 56</i>) | 530 |
| — swab stand (<i>Fig. 57</i>) | 530 |
| Abdominal surgery, miscellaneous | 9 |
| Abduction treatment of fractures of neck of femur | 198 |
| Abortion due to epidemic encephalitis | 171 |
| — maternal mortality in relation to | 371 |
| Abscess of brain, otitis | 165 |
| — hard palate | 332 |
| Abscess, ischio-rectal | 249 |
| — of kidney (<i>see</i> Kidney, Abscess of) | 17 |
| — liver, amebic | 286 |
| — due to treatment | 286 |
| — lung (<i>see</i> Lung, Abscess of) | 286 |
| — paraneuritic, clinical aspects and diagnosis | 264 |
| — paraplaryngeal | 354 |
| — perinephric, acute haematogenous | 263 |
| — due to staphylococcal infection | 448 |
| — peritonsillar | 354 |
| — retropharyngeal | 354 |
| Abscess, subphrenic | 450 |
| Abscesses, dental, infection and | 132 |
| Abstinent, prohibition of | 12 |
| — toxic vegetable oils in | 12 |
| Acacia in diabetic coma | 143 |
| — and sodium chloride in shock | 376 |
| Accident emergency case for motor-cars (<i>Fig. 96</i>) | 541 |
| Acetate of aluminium in lupus vulgaris | 301 |
| Acetic-anhydride (Boltz) test on cerebrospinal fluid | 91 |
| Acetylcholine in arterial hypertension | 524 |
| — Raynaud's disease | 524 |
| Aciduria and infection of the gastrointestinal tract | 131 |
| — pernicious anaemia and | 21, 24 |
| — secondary anaemia and | 27 |
| Achlorhydric anaemia, simple | 28 |
| Achloric jaundice, congenital, splenectomy in | 445 |
| — in infants and children | 18 |
| Achlorion quinecanum, favus and | 429 |
| Achylia gastrica, pernicious anaemia and | 20, 21, 24 |
| Acid therapy for hypochlorhydria with asthma in children | 57 |
| Acidity, blood, effect of gaseous anaesthetics and of avertin on | 35 |
| Acidosis associated with encephalopathies in Addison's disease | 450 |

| | PAGE |
|---|----------|
| Acidosis, citralka alkalizing salts for | 525 |
| — radium treatment and | 398 |
| Acids, fatty, relation to remission of pernicious anaemia | 26 |
| Acidulous lozenges in post-operative salivary-gland infections | 380 |
| Acridine compound in amebic dysentery | 16 |
| Acrilavine in burns | 86 |
| — gonorrhoea | 224 |
| — sterilization of skin and | 375 |
| Acromegaly, rôle of pituitary in | 357 |
| Actinomycosis | 431 |
| — renal, clinical | 264 |
| — diagnosis | 265 |
| — prognosis | 264 |
| — treatment | 265 |
| — tuberculosis and | 265 |
| Adalin treatment of chorea | 49 |
| Adison's anaemia (<i>see</i> Anæmia, Pernicious) | 450 |
| Adenoiditis, acute, in measles epidemic | 307 |
| Adenoids, asthma in children and | 37 |
| — dental treatment and | 135 |
| — nasal sinusitis in children and | 325 |
| Adhesions, abdominal | 9 |
| — due to gonococcal infections | 223 |
| Adrenal glands (<i>see</i> Suprarenal Glands) | 59, 334 |
| Adrenalin in asthma | 305 |
| — chronic malaria | 164 |
| — as haemostatic in mastoid operations | 219 |
| — and histamine compounds in glaucoma | 9 |
| — novocain in creeping local anaesthesia | 167 |
| — in vertigo of labyrinthine origin | 524 |
| Adrephline lix. "B" in asthma, hay fever, and urticaria | 152 |
| Agranulocytosis in diphtheria | 530 |
| Airway, Magill's (<i>Fig. 58</i>) | 436 |
| Austrin, small-pox and | 102 |
| Albargin emema in ulcerative colitis | 126 |
| Albuminuria (<i>see also</i> Nephritis) | 182 |
| — in dengue fever | 86 |
| — following erythema nodosum | 350 |
| Alcohol, absolute, in treatment of burns | 329 |
| — as etiological factor in pellagra | 400, 402 |
| — injections into (Gasserian ganglion in trigeminal neuralgia | 37 |
| — for prolapse of rectum | 37 |
| — intravenous administration, apparatus for (<i>Fig. 2</i>) | 37 |
| — in isotonic glucose as intravenous anaesthetic | 180 |
| — local treatment of erysipelas | 233 |
| — over-indulgence in, heart efficiency and | 375 |
| — sterilization of skin and | 12 |
| — as a therapeutic agent, decline in use of | 148 |
| — in treatment of diabetes | 465 |
| — hydrocele | 238 |
| — inguinal hernia | 427 |
| — mercury pigmentation | 10 |
| Alcoholism | 11 |
| — delirium tremens | 578 |
| — institutions for | 10 |
| — psychotherapy in | 12 |
| — toxicity of abstinence | 12 |

| | PAGE | | PAGE |
|--|------------|--|---------|
| Aldehyde in diagnosis of kala-azar | 254 | Anæsthesia apparatus, Magill's (<i>Fig. 59</i>) .. | 530 |
| Alfalfa as a source of pyrrrol | 128 | — cardiac patients and | 235 |
| Alimentary rest in the treatment of sprue .. | 446 | — creeping local | 33 |
| Alkaliphores in tonsillar tætor | 471 | — cyclopropane in | 33 |
| Alkalins in blackwater fever | 63 | — for diabetic operations | 146 |
| — oedema due to acidosis | 253 | — gaseous, effect on blood acidity | 35 |
| Alkalosis, sodium treatment and | 398 | — inhaler for open ether administration | |
| Allergic symptoms of asthma in children .. | 57 | (<i>Fig. 91</i>) | 539 |
| Allergy in family a predisposition to asthma | | — local, pericaine in | 38, 527 |
| in children | 56 | — mouth-opener and airway in (<i>Fig. 99</i>) .. | 542 |
| Allonal for pain due to intrathoracic tumours | 298 | — preliminary medication | 33 |
| Aluminium acetate in lupus vulgaris | 301 | — — for children | 38 |
| Alveolar bone, mastication and | 139 | — spinal, analysis of spinal fluid following .. | 33 |
| Amenorrhœa, oestrin in treatment of | 314 | — complications | 33 |
| — ovarian and placental hormones and .. | 343 | — danger of stavaine in | 30 |
| Ametox in treatment of pigmentation from | | — ephedrine in | 31 |
| bismuth absorption | 356 | — magnesium sulphate for use after .. | 31, 33 |
| Anamniated mercury ointment in favus .. | 429 | — neocaine in | 31 |
| Anamniolum chloride in nephrosis | 408 | — novocain in | 30 |
| — ortho-iodoxy-benzoate in rheumatism | | — objections to use of | 33 |
| and arthritis | 418 | — for paralytic ileus | 33 |
| — salts in ascites | 408 | — pericaine in | 32 |
| — — myocardial insufficiency | 408 | — Pitkin's method | 31, 33 |
| Amniotin in relief of menopausal symptoms | 344 | — sensory and motor elements and their | |
| Anæbiasis | 16 | reaction to drugs | 30 |
| — predisposition to sprue and | 447 | — spino-cain in | 31 |
| Anæbic abscess of liver | 17 | — spinal, in treatment of tæus | 246 |
| — — treatment | 286 | — Trendelenburg position and blood- | |
| — hepatitis | 17 | pressure in | 31 |
| Anæst as an anæsthetic in obstetrics | 35 | — for thoracic operations | 34 |
| — for preliminary medication in anæsthesia | 33 | — thoracoplasty in pulmonary tuberculosis | 483 |
| Anæmia, achlorhydric, simple | 28 | Anæsthesin in nasal treatment of asthma .. | 534 |
| — in chronic neuritis | 406 | — pruritus ani et vulvæ | 387 |
| — colloidal copper in | 523 | Anal fissure, diathermy in treatment .. | 151 |
| — dental caries and | 128 | Anæsthesia, spinal (<i>see Anæsthesia, Spinal</i>) | |
| — following polycythæmia rubra vera | 182 | Anastomosis, uretero-uretral | 499 |
| — hæmolytic, acute secondary | 28 | Aneurysm, congenital, intracranial hæmo- | |
| — in infants and children | 18 | rrhage due to bursting of | 247 |
| — idiopathic secondary, treatment with iron | | — of splenic artery, rupture of | 445 |
| and copper | 29 | Angina abdominalis | 52 |
| Anæmia in infants and children: | | Angina pectoris (<i>see also Coronary</i>) .. | 38 |
| liver therapy | 18 | — artificial induction of symptoms .. | 40 |
| — non-hæmolytic, of infants and children .. | 19 | — etiology | 39, 40 |
| Anæmia, pernicious | 19 | — clinical aspects | 38 |
| — achlorhydria and | 21, 24 | — hyperthyroidism and | 42 |
| — achylia gastrica and | 29, 21, 24 | — as a sequel of influenza | 42, 245 |
| — blood transfusion in | 25 | Anginal pain, significance of | 42 |
| — diagnosis by the halometer | 21 | Angioma, cerebellar (<i>see Lindau's Disease</i>) | |
| — due to dental sepsis | 131 | — of a renal papilla | 262 |
| — etiology | 20 | Angiomatosis, retinal, Lindau's disease and | 282 |
| — gastric defect in etiology | 21 | Angiomatous cyst over mid-brain (<i>Fig. 39</i>) | 281 |
| — gastro-intestinal disorders and | 20 | — tumours of brain, hæmorrhagic and .. | 249 |
| — in infants and children | 18 | Angioplastomatosis universalis (<i>see Lindau's</i> | |
| — insulin as an auxiliary to liver diet .. | 24 | Disease) | |
| — liver treatment of (<i>see Liver Treat-</i> | | Anhalonium leishnii as source of mescaline .. | 12 |
| ment) | 25 | Ankylosis of vertebrae due to injured inter- | |
| — nervous and mental aspects of | 25 | vertebral discs | 441 |
| — of pregnancy | 25 | Ankylostomiasis | 43 |
| — relation of cholesterol, lecithin phos- | | Anopheles (<i>see Mosquitoes</i>) | |
| phorus, and fatty acids to the remis- | | Anorexia, congenital | 43 |
| sion of | 26 | Anorexia nervosa | 45 |
| — sprue in relation to | 447 | Anti-dysenteric serum in ulcerative colitis | 105 |
| — staphylococcal septicæmia complica- | | Anti-erysipelas serum in erysipelas .. | 179 |
| ting | 448 | Antimeulogococcal serum in cerebrospinal | |
| — stomach preparations in treatment .. | 24, 529 | fever | 88 |
| Anæmia, secondary | 27 | Antimony in dermal leishmaniasis | 256 |
| — achlorhydria and | 27 | — diagnosis of kala-azar | 254 |
| — of alimentary origin | 29 | — in kala-azar | 256 |
| — due to dental sepsis | 131 | — schistosomiasis | 425 |
| — undernutrition | 28 | Antiscorbutic vitamin deficiency and dental | |
| — with high reticulocyte count, treat- | | caries | 127 |
| ment | 29 | Antistreptococcal serum in septicæmia .. | 302 |
| — liver treatment of | 27, 29, 30 | Antitoxin, diphtheria, for intraperitoneal | |
| — mechanism of | 27 | therapy in children | 95 |
| — renal function and | 405 | — in diphtheria | 154 |
| — response of reticulocytes to various | | — scarlet fever | 423 |
| treatments of | 29 | Antityphoid inoculation, compulsory, in | |
| — ventricular stomach tissue in | 24, 529 | laboratories | 491 |
| — von Jaksch's | 19 | Antivaccinal sheep serum in treatment of | |
| Anæsthesia | 30 | generalized vaccinia | 502 |

| | PAGE | | PAGE |
|---|---------------|---|----------|
| Antivirus therapy in pyogenic infections .. | 393 | Asbestosis, pulmonary, symptomatic treat- | |
| Anuria, parathormone in symptomatic treat- | | ment, failure of .. | 56 |
| ment .. | 348 | — — symptoms, diagnosis, and radiology .. | 54 |
| Anus, imperforate, determination of treat- | | Aschheim-Zonleik test for pregnancy .. | 371 |
| ment .. | 402 | Ascites, treatment of .. | 408 |
| — prolapse of, in adults, plastic operation .. | 46 | Aspergillus nidulans, maduromycosis due to .. | 431 |
| — — children, cure without operation .. | 46 | Asphyxia in new-born, intracranial birth | |
| Anus and rectum, prolapse of .. | 46, 400 | injuries and .. | 272 |
| Anxiety states a type of mental depression .. | 312 | Aspiration in abscess of lung .. | 287, 288 |
| Aorta, abdominal, non-syphilitic lesions of .. | 52 | — amebic liver abscess .. | 18, 286 |
| — angina pectoris and .. | 40 | — empyema in children .. | 170 |
| Aphonia, functional, classification and causes .. | 273 | — hæmatoma of auricle .. | 161 |
| — — treatment .. | 273 | — nasal sinusitis .. | 326 |
| Apoplexies, abdominal .. | 226 | — pleurisy .. | 365 |
| Appendicitis .. | 46 | Asthma, adrephine Rx. 'B' in .. | 524 |
| Appendicitis in children .. | 47 | Asthma in children .. | 56 |
| — as a complication of typhoid fever .. | 492 | — — age incidence .. | 56 |
| — diagnosis .. | 46 | — — allergic symptoms .. | 57 |
| — due to dental sepsis .. | 131 | — — hereditary predisposition .. | 56 |
| — etiology .. | 46 | — — hypochlorhydria and .. | 57 |
| — influenza in the causation of .. | 246 | — — nose and throat in .. | 57 |
| — post-operative massive collapse of lung in .. | 379 | — — onset .. | 56 |
| — syphilitic .. | 47 | — — sex incidence .. | 56 |
| — treatment .. | 47 | — — types of .. | 57 |
| — X-ray diagnosis .. | 518 | — as a complication of hyperthyroidism .. | 468 |
| Appendicectomy in bacillary dysentery .. | 159 | — eosinophilia in sputum an indication of .. | 59 |
| — ulcerative colitis .. | 105 | — etiology .. | 58, 59 |
| Aqueous extract of liver in treatment of | | Asthma and hay fever .. | 57 |
| pernicious anæmia .. | 23 | — hereditary factor .. | 57 |
| Aro-light baths in lupus vulgaris .. | 300 | — nasal diseases and .. | 334 |
| Argyrol in gonococcal infection of the skin .. | 224 | — treatment .. | 59 |
| — nasal sinusitis .. | 326 | — types of .. | 58 |
| Argyrosis of conjunctiva .. | 107 | Asthmatic bronchitis, bronchial asthma and .. | 59 |
| Aromatic sulphuric acid ulcerative colitis .. | 104 | Atelectasis, bronchial obstruction and .. | 291 |
| Arrhythmia and electrocardio- | | — pneumococcal pneumonia an .. | 367 |
| graphy .. | 49 | Atoxyl in treatment of blackwater fever .. | 63 |
| Arsenic in abscess of lung .. | 288, 289 | Atropine in artificial silk conjunctivitis .. | 108 |
| — dermatitis in treatment of syphilis, pre- | | — diverticulitis .. | 106 |
| vention of .. | 458 | — hyperpyrexia in infancy due to, hydro- | |
| — in epilepsy due to epidemic encephalitis .. | 172 | therapy for .. | 241 |
| — poisoning from sheep-dipping .. | 243 | — in relief of enterospasm .. | 247 |
| — in rheumatism and arthritis .. | 416 | Audiometer for testing hearing .. | 123 |
| — sensitization of skin .. | 434 | Auditory imperception, congenital .. | 60 |
| — tests for hypersensitivity to .. | 459 | Auricular fibrillation in children .. | 50 |
| Arsenical compounds for intraperitoneal | | — — etiology .. | 49 |
| therapy in children .. | 95 | — — post-operative paroxysmal .. | 49 |
| Arsenobenzene treatment, prevention of | | — — prognosis .. | 50 |
| dermatitis .. | 458 | Autogenous vaccine in dental sepsis sen- | |
| Arsenobenzene-resistant syphilis .. | 458 | sitization .. | 132 |
| Arson, criminal lunatics and .. | 311 | Autohamotherapy in syphilis .. | 460 |
| Arterial hypertension (<i>see</i> Blood-pressure, | | Autosuggestion in alcoholism .. | 11 |
| High) | | Averin as an anæsthetic, critical study .. | 35 |
| Arteries (<i>see also</i> Blood-vessels) | | — effect on blood acidity .. | 36 |
| — coronary (<i>see</i> Coronary) | | — elimination by thyroxin .. | 35 |
| Arteries, diseases of .. | 52 | — for preliminary medication in anæsthesia .. | 33 |
| — peripheral, diseases of, classification .. | 70 | Axis cylinders in spread of virus of polio- | |
| Arteriosclerosis, retinal, in diagnosis of cer- | | myelitis .. | 369 |
| tain diseases .. | 72 | — of heart, electrical, electrocardiographic | |
| Arteriovenous fistula, surgery of .. | 69 | determination of .. | 52 |
| Arthritis (<i>see also</i> Rheumatism and Arthritis) | | Ayahnsa as a source of banisterin .. | 173 |
| — — deformans due to gonococcal arthritis .. | 223 | Ayerza's disease, symptoms and etiology .. | 53 |
| — — following chicken-pox .. | 94 | 'Azoule' solution A.B.A. in skin diseases .. | 524 |
| — — gonococcal (<i>see</i> Gonococcal Arthritis) | | | |
| — — infective, soliznot drugs in .. | 528 | | |
| Arthrodesis, extra-articular, in tuberculous | | | |
| hip-joint .. | 486 | | |
| Arthropathy, Charcot's .. | 461 | | |
| Artificial light treatment in tuberculosis .. | 355 | | |
| — limbs, belt for (<i>Fig.</i> 62) .. | 532 | | |
| — pneumothorax in abscess of lung .. | 288, 289 | | |
| — — apparatus (<i>Fig.</i> 60) .. | 531 | | |
| — — in phthisis .. | 479, 481, 482 | | |
| — — silk conjunctivitis .. | 107 | | |
| Asbestos dust, examination and analysis of .. | 55 | | |
| Asbestosis bodies (<i>Figs.</i> 3-7) .. | 55 | | |
| Asbestosis, pulmonary .. | 54 | | |
| — — causes, pathology, and prophylaxis .. | 242 | | |
| — — classification .. | 56 | | |
| — — 'curious bodies' in (<i>Figs.</i> 3-7) .. | 55 | | |
| — — progress of the disease .. | 55 | | |

| | |
|---|----------|
| BACILLARY dysentery .. | 158 |
| — Bacillus acidophilus odontolyticus and | |
| dental caries .. | 131 |
| — — in treatment of diverticulitis .. | 197, 157 |
| — acutrycke infection due to sheep-dipping .. | 244 |
| — botulinus in food poisoning .. | 191 |
| — coli in etiology of hæmoglobinuria in new- | |
| born .. | 321 |
| — — gall-bladder infection .. | 285 |
| — — ischiorectal abscess due to .. | 250 |
| — — in purulent gonorrhoeal orchitis .. | 222 |
| — — pyuria and .. | 353 |
| — — Friedländer in sputum of asthmatics .. | 59 |
| — — influenza in abscess of lung .. | 287 |
| — — pneumonia .. | 367 |
| — — edematiens in gas gangrene .. | 208 |

| | PAGE |
|---|----------|
| <i>Bacillus paratyphosus</i> | 349 |
| — <i>perfringens</i> , anti-gangrene serum and .. | 493 |
| — — in gas gangrene | 208 |
| — <i>pestis</i> , plague and | 364 |
| — <i>proteus</i> in etiology of ureteral calculus .. | 499 |
| — <i>typhosus</i> , anti-gangrene serum and .. | 493 |
| Back injuries (<i>see also</i> Spine) | 333 |
| Bacte-pyo-chir, new preparation of bacteriophages | 524 |
| Bacterial invasion in etiology of pyorrhea alveolaris | 129 |
| Bacteriological examination of sputum in asthma | 59 |
| Bacteriophage treatment of bacillary dysentery | 159 |
| — — <i>cholera</i> | 96 |
| — — <i>plague</i> | 364 |
| — — pyogenic infections of skin | 432 |
| <i>Bacterium granulosis</i> in trachoma | 109 |
| <i>Banisteria caapi</i> | 173 |
| Banisterin in post-encephalitic Parkinsonism .. | 173 |
| Barbitone derivative (amytal) for preliminary medication in anaesthesia | 33 |
| Baseball finger | 462 |
| Basophil cells in anterior lobe of pituitary .. | 357 |
| — sex hormones and | 357 |
| Bathing in relation to ear conditions | 160, 452 |
| — skin infections | 428, 452 |
| — various conditions transmitted by public baths | 451 |
| Bayer 205 in treatment of trypanosomiasis .. | 474 |
| B.C.G. test of cerebrospinal fluid | 92 |
| — vaccine in prophylaxis of pulmonary tuberculosis | 476 |
| Bed foot-rest (<i>Fig. 61</i>) | 532 |
| Bed-frame, reversible, for spinal injuries .. | 444 |
| Belt for artificial limbs (<i>Fig. 62</i>) | 532 |
| Benacoi injections for pruritus ani et vulvæ .. | 387 |
| Bence-Jones proteinuria, renal insufficiency and | 406 |
| Beri-beri | 62 |
| — comparison of vitamin B in whole-wheat and white bread | 62 |
| — etiology | 62 |
| — heart failure of, causation | 62 |
| — treatment | 62 |
| Berlock dermatitis | 427 |
| Bezold's mastoiditis | 164 |
| Bicarbonate of soda in oedema due to acidosis .. | 354 |
| Bilberry in inguinal hernia | 238 |
| Bile salt compound tablets, indications .. | 524 |
| Bile-ducts, reconstruction of, in injury to common duct | 205 |
| — visualization of, following cholecystectomy .. | 203 |
| <i>Bilharzia mansoni</i> , Egyptian splenomegaly due to | 446 |
| Bilharziasis | 425 |
| — Bilroth operation for peptic ulcers | 213 |
| — II operation in cancer of stomach | 449 |
| Biocholine in tuberculosis | 524 |
| B.I.P.F., pigmentation after use of | 356 |
| Birth control, maternal mortality and | 371 |
| — injuries, intracranial | 272 |
| Bismuth absorption, pigmentation from | 356 |
| — in amebic dysentery | 17 |
| — carbonate in diphtheria | 155 |
| — in lupus erythematosus | 300 |
| — surgical tuberculosis | 486 |
| — ulcerative colitis | 104 |
| Bismuth-iodized gauze pack in empyema .. | 170 |
| Blackwater fever | 63 |
| Bladder decompression in enlarged prostate, importance of gradual methods | 507 |
| — distended, methods for emptying | 507 |
| — drainage in perineal prostatectomy | 382 |
| — hernia of | 64 |
| — rupture of | 64 |
| — pelvic fractures and | 197 |

| | PAGE |
|---|---------------|
| Bladder, surgery of | 63 |
| — tumours of | 65 |
| — — cystoscopy in diagnosis | 67 |
| Blastomycosis, nomenclature | 100 |
| — organisms producing | 101, 429, 430 |
| Blind spots, enlargement of, in cerebral tumours | 78 |
| Blisters from burns, treatment | 86 |
| Blood acidity, effect of gaseous anaesthetics and of avertin on | 35 |
| — calcium content, hyperparathyroidism and | 345-7 |
| — — otosclerosis and | 342 |
| — — renal rickets and | 410 |
| — — in skin diseases | 428 |
| — cells, supravital staining of large mononuclears in leukemia | 279 |
| — changes under ethylene anaesthesia | 35 |
| Blood chemistry of skin diseases | 427 |
| — chlorides in skin diseases | 427 |
| — cholesterol, cholelithiasis and | 286 |
| — — diabetes and | 142 |
| — — in filariasis | 189 |
| — — radium treatment and | 398 |
| — — renal rickets and | 410 |
| — — xanthoma and | 510 |
| — citrated whole, in treatment of haemophilia | 226 |
| — coagulation of | 375 |
| — composition, dental caries and | 128 |
| — — radium treatment and | 398 |
| — count in cardiovascular renal disease .. | 405 |
| — cultures in typhoid fever, importance of early | 492 |
| — diastase content of, in pancreatitis | 344 |
| — examination of, in mental diseases | 25 |
| — — varicella | 94 |
| — halometer for measuring red cells | 21 |
| — immunized, in dental sepsis sensitization .. | 132 |
| — indican determination in renal insufficiency | 405 |
| — nitrogen and anemia in chronic nephritis | 406 |
| — — in skin diseases | 427 |
| — picture in Hodgkin's disease | 303 |
| — — school-children | 19 |
| — plasma, human, in haemophilia | 226 |
| — protein changes in malaria, diagnostic value | 305 |
| — regeneration in severe secondary anemia .. | 27 |
| — serum, action of, on pathogenic trypanosomes | 475 |
| — — treatment of herpes zoster | 240 |
| — sugar, coagulation time and | 375 |
| — — level, glucose enema and | 352 |
| — — low, hyperinsulinism and | 143, 176 |
| — — in skin diseases | 427 |
| — transfusion in achlorhydric anemia | 28 |
| — — acute hemolytic anemia | 28 |
| — — anemia of kala-azar | 256 |
| — — coagulation and | 375 |
| — — in haemoglobinuria following chicken-pox | 94 |
| — — hemolytic anemia | 18 |
| — — pernicious anemia | 25 |
| — — — of pregnancy | 26 |
| — — reactions to | 375 |
| — — — classification | 376 |
| — — — in sprue | 447 |
| Blood-pressure, cardiovascular stability and .. | 232 |
| Blood-pressure, continuous registration of | 72 |
| — familial polycystic disease of kidneys and | 408 |
| Blood-pressure, high | 72 |
| — — conditions in the ocular fundi in | 73 |
| — — importance of gradual decrease | 507 |
| — — treatment | 73, 524, 625 |
| — — variations and time factor | 72 |
| — pituitrin and | 358 |

| | |
|---|---------|
| | PAGE |
| Blood-stream infections due to dental sepsis | 181 |
| Blood-urica estimation, uræmia and | 383 |
| Blood-vessels, aberrant, focal lobulation and | 269 |
| Blood-vessels, surgery of | 69 |
| Bolis, costan'a tin preparation for | 525 |
| -- recurrence of, due to dental sepsis | 182 |
| -- vaccine treatment in | 393 |
| Boltz (acetic-anhydride) test on cerebrospinal fluid | 91 |
| Bone-marrow, dysfunction of, secondary anaemia and | 27 |
| -- function of, relationship to stomach | 20 |
| Bone-pegging in tuberculous joints | 488 |
| Bone-plating operation, retractor for (<i>Pig.</i> 120) | 548 |
| Bones, long, tumours of | 74 |
| -- X-ray examination of | 511 |
| Books, infection from | 244 |
| Books of the year | 551 |
| Borax in follicular tonsillomycoais | 470 |
| Bordet-Wassermann test for syphilis | 453 |
| Boric acid, iodized, insulations in otitis media | 162 |
| Boric-salicylic ointment in lupus vulgaris | 501 |
| Boroformate of sodium in chancreoid | 93 |
| Hotallo's duct, patent | 231 |
| -- -- X-ray diagnosis | 235 |
| Bottles for sterile solutions (<i>Pig.</i> 63) | 532 |
| Botulism, symptoms | 191 |
| -- tuned food and | 191 |
| -- treatment | 191 |
| Brachial neuritis | 414 |
| Bradford frame in treatment of pelvic fractures | 198 |
| Bradycardia, heart efficiency and | 232 |
| Brain, abscess of, otitic | 165 |
| -- angiomatous tumours of, hamorrhage and | 249 |
| -- disease, organic, influenza in amelioration of | 319 |
| -- gliomas of, hamorrhage into | 248 |
| -- surgery, anesthesia by ether per rectum | 35 |
| Brain, tumours of (<i>see also</i> Lindau's Disease; Pituitary Gland, Tumours of) | |
| -- --- choked discs in | 77 |
| -- --- decompression in | 75 |
| -- --- enlargement of blind spots | 78 |
| -- --- hamorrhage from | 247 |
| -- --- mortality-rate of operations | 76 |
| -- --- tuberculomas | 475 |
| -- --- ventriculography in diagnosis of | 76 |
| -- --- X-ray examination of | 513 |
| Bread, dietetic value in treatment of diabetes | 148 |
| Breast, cancer of, lymph-glands and | 81 |
| -- radiotherapy in | 81, 396 |
| Breast, fat necrosis of | 79 |
| Breast, tumours of | 79 |
| -- changing clinical picture | 79 |
| -- difficulty of early diagnosis | 79 |
| -- hamorrhage from the nipple.. . . . | 80 |
| -- X-ray examination of | 520 |
| Breast-feeding and prevention of dental caries | 126 |
| Bright's disease (<i>see Nephritis</i>) | |
| British spas | 582 |
| Broders' histological classification of tumours, objection to | 67 |
| Bromides in alcoholism | 11 |
| -- high blood-pressure | 78 |
| Bromsulphalein test for diseases of liver | 286 |
| Bronchi, foreign bodies in | 193 |
| Bronchial asthma (<i>see Asthma</i>) | |
| -- fistula, persistent, treatment | 289 |
| -- obstruction complicating laryngectomy | 275 |
| -- -- X-ray diagnosis | 515 |
| Bronchectasis | 83 |
| -- diagnosis | 84 |
| -- early clinical picture | 83 |
| -- lobotomy in | 289 |
| -- nasal sinustis and | 328 |

| | |
|--|----------|
| Bronchiectasis, treatment .. | PAGE |
| — X-ray diagnosis .. | 84, 85 |
| Bronchitis, asthmatic, in children .. | 84, 515 |
| Bronchography with lipiodol in diagnosis of .. | 57 |
| — bronchiectasis .. | 84 |
| Bronchopneumonia as complication of .. | 492 |
| — typhoid fever in infants .. | 289 |
| Bronchoscopy in abscess of lung .. | 287, 289 |
| — (diagnosis of intrathoracic tumours .. | 295 |
| — treatment of bronchiectasis .. | 85 |
| Brucellæ abortus et melitensis, undulant .. | 496 |
| — fever and .. | 139 |
| Buccal cavity, cancer of, dental treatment in .. | 138, 396 |
| — ——— radium in .. | 340 |
| Buccosuccal operation for dental cysts .. | 270 |
| Bulst's abdominal pads in occipito-posterior .. | 425 |
| — presentations .. | 85 |
| Bullinus snails, schistosomiasis and .. | 86 |
| Burns. .. | 86 |
| — near the rectum, treatment of .. | 86 |
| — superficial, treatment of erythema from .. | 85 |
| — tannic acid treatment .. | 86 |
| — treatment of shock .. | 118 |
| Burnt sienna in corneal tattooing .. | 94 |
| Bursitis following chicken-pox .. | 525 |
| 'Bynol' hepal, a new liver extract .. | 63 |

| | |
|---|-------------|
| CACODYLATE of sodium in black- | PAGE |
| — water fever .. | 306 |
| — ——— malaria .. | 159 |
| Caecostomy in bacillary dysentery .. | 269 |
| Caesarean section in placenta prævia .. | 230 |
| Caffeine, action upon the heart .. | 408 |
| — in myocardial insufficiency .. | 432 |
| Calamine in treatment of sycosis barbæ .. | 514 |
| Calcification, intracranial .. | 256 |
| Calcification of kidney .. | 351 |
| Calcification of pericardium .. | 351 |
| — ——— X-ray diagnosis .. | 351, 516 |
| Calcium in blood, otosclerosis and .. | 342 |
| — ——— skin diseases and .. | 428 |
| — ——— chloride as a blood coagulant .. | 375 |
| — ——— in cholera .. | 98 |
| — ——— and hydrochloric acid in tetany .. | 348 |
| — ——— in pyuria .. | 353 |
| — ——— after removal of parathyroid tumour .. | 348 |
| — ——— solution for intravenous injection .. | 525 |
| — ——— in sprue .. | 447 |
| — ——— in the control of sensitization to insulin .. | 145 |
| — ——— deficiency in etiology of pyorrhœa .. | 130 |
| — ——— alveolaris .. | 348 |
| — ——— (diet in latent tetany .. | 348 |
| — ——— lactate in latent tetany .. | 348 |
| — ——— sprue .. | 447 |
| — ——— metabolism and dental caries .. | 126 et seq. |
| — ——— parathyroid glands and .. | 348 |
| — ——— in sprue .. | 446, 447 |
| — ——— vasomotor rhinitis .. | 333 |
| Calculi, biliary, blood-cholesterol and .. | 280 |
| — ——— bladder, contra-indications to crushing .. | 6 |
| — ——— renal, in diagnosis of hyperparathyroid- .. | 34 |
| — ——— ism .. | 51 |
| — ——— X-ray examination during operation .. | 34 |
| — ——— ureteral .. | 49 |
| Calendar .. | 585-600 |
| Calophyllum bigitor, preparations from, in .. | 27 |
| — ——— treatment of leprosy .. | 23 |
| Cameron surgical lights .. | 43 |
| Camphor in treatment of sycosis barbæ .. | 24 |
| Cancer of bladder, treatment .. | 6 |
| — ——— breast, lymph-glands and .. | 8 |
| — ——— radiotherapy in .. | 81, 339 |
| — ——— cervix uteri .. | 50 |
| — ——— radium in .. | 294, 339 |
| — ——— colon .. | 10 |
| — ——— corpus uteri, treatment .. | 339 |
| — ——— diagnosis by gastric analysis .. | 20 |
| — ——— of gall-bladder .. | 20 |
| — ——— kidney .. | 26 |

| | PAGE | | PAGE |
|---|----------|--|----------|
| Cancer of larynx | 274 | Cerebrospinal fluid | 88 |
| — lip, treatment | 283 | — abscess of brain and | 166 |
| — liver, secondary, diagnosis | 286 | — B.O.G. test | 92 |
| Cancer of lung (Fig. 42) | 293 | — Boltz (acetic-anhydride) test | 91 |
| — mouth, auxiliary dental treatment | 139 | — changes after spinal anaesthesia | 33 |
| — — radium treatment | 138, 396 | — circulation of | 88 |
| — — occupational | 337 | — etiology of headache following lumbar | |
| — of oesophagus | 337 | — — puncture | 89 |
| — pancreas, head of | 345 | — — examination by ultra-violet light | 89 |
| — — mistaken for sprue | 447 | — — importance of gradual withdrawals | 507 |
| Cancer of penis | 350 | — — refractive index of | 89 |
| — prostate | 385 | — — the Taraka-Ara test | 91 |
| — radium treatment in (<i>see</i> Radium) | | — — Wassermann reactions in cases of | |
| — of rectum (<i>see</i> Rectum) | | — — meningitis | 91 |
| — relation to ulcers | 209 | Certificates, signing of, legal decision <i>re</i> | 276 |
| — of small intestine | 247 | Cervicitis, chronic, etiology | 501 |
| — squamous-celled, due to irradiation | 398 | — — pathology | 501 |
| — of stomach | 449 | Cervix uteri, carcinoma of, radium in | 394 |
| — syphilis | 457 | — — cervicitis and | 501 |
| — of tongue | 457 | — — erosions of, modern nomenclature | 501 |
| — vagina, radium in | 394 | Chancroid | 92 |
| — vulva, diathermy in | 395 | Charcoal in treatment of ulcerative colitis | 104 |
| — — radium in | 394 | Charcot's arthropathy | 461 |
| Cancerum oris due to bismuth absorption | 356 | Chaulmoogra oil in leprosy | 278 |
| Capitellum, ossifying, X-ray diagnosis | 511 | — — trachoma | 110 |
| Capsule forceps, Alexander's (<i>Fig. 73</i>) | 535 | Chenopodium, oil of, in hookworm disease | 43 |
| Carbohydrate diet in treatment of Addison's | | Chewing-gum for post-operative salivary | |
| disease | 450 | — gland infections | 380 |
| — metabolism, abnormal, in diphtheria | 152 | Chicken-pox | 94 |
| — — pituitrin and | 559 | — infectivity | 95 |
| Carbohydrates in diabetic diets | 140 | — — prophylaxis | 95 |
| — — to lessen vomiting under anaesthesia | 38 | — — symptoms and complications | 94 |
| Carbolic acid in treatment of hydrocele | 464 | Children (<i>see also</i> Infants) | 9 |
| Carbon arc light treatment in intestinal | | — abdominal injuries in | 9 |
| tuberculosis | 356 | Children, anaemia in : liver therapy | 18 |
| — dioxide foam baths | 353 | — asthma in (<i>see</i> Asthma in Children) | |
| — — hyperventilation in collapse of lung | 292 | — chronic mucous gastritis in | 44 |
| — — and oxygen as a respiratory stimulant | 82 | — dental supervision in U.S.A. | 130, 134 |
| — — snow in coecidial granuloma | 100 | — dentistry in (<i>see</i> Dentistry, Children's) | |
| — — — for strictures due to gonorrhoeal | | — edentulous, mouth-gag for (<i>Fig. 98</i>) | 542 |
| proctitis | 291 | — empyema in, treatment | 170 |
| — — — in trachoma | 111 | — feeble-minded, mental development of | 310 |
| — — — warts | 236 | Children, intraperitoneal therapy | 95 |
| — — — tetrachloride in Egyptian splenomegaly | 446 | — in | |
| — — — hookworm disease | 45 | — mental deficiency in (<i>see</i> Mental Deficiency) | |
| Carbonate of bismuth in diphtheria | 155 | — nasal sinusitis in | 325 |
| Carbuncles, diabetes and | 147 | — — typhus fever in | 495 |
| — — local vaccine treatment in | 393 | Chlorides in blood, skin diseases and | 427 |
| — — operative technique | 147 | Chlorine gargles in treatment of membranous | |
| Carcinoma (<i>see</i> Cancer) | | tonsillomyositis | 470 |
| Carcinosis, military, X-ray examination | 297 | Chloroform in thoracic operations | 34 |
| Cardiac (<i>see also</i> Heart) | | Choked discs in intracranial tumours | 77 |
| — lesions, rare, electrocardiographic identi- | | Cholecystectomy for intramural stones | 203 |
| fication | 52 | — — in pancreatitis | 344 |
| — pain, significance of | 42 | Cholecystenterostomy for chronic jaundice | 205 |
| — syphilis | 231 | Cholecystogastrostomy for cholecystitis, ad- | |
| — — electrocardiography in | 232 | — vantages of | 205 |
| — thrombosis determined by streptococcal | | Cholecystitis | 284 |
| infection | 40 | — avertin as an anæsthetic in | 35 |
| Cardiolysis, operation for | 233 | — due to dental sepsis | 131 |
| Cardiospasm | 337 | — gonococcal infection and | 224 |
| 'Cardiovascular renal' disease, blood-count in | | — treatment | 205 |
| — system and dyspepsia | 159 | Cholecystography | 203 |
| Caries, dental | 126 | — and pyelography in diagnosis | 519 |
| Casarrh, diagnostic and midwifery | 533 | Choledcho-duodenostomy, internal and | |
| Catechu, spring, treatment of | 108 | — external | 205 |
| Catechu in inguinal hernia | 238 | Choledochotomy, technique | 205 |
| Catheter, mucus, an improved (<i>Fig. 100</i>) | 542 | Cholelithiasis, blood-cholesterol estimation | |
| Catheterization in post-operative retention | 65 | — and | 286 |
| Cautery excision of abscess of lung | 289 | Cholera | 96 |
| — — punch operation for prostatic obstruction | 381 | — bacteriophage treatment | 96 |
| Cerebellar angioma (<i>see</i> Lindau's Disease) | | — experimental | 96 |
| Cerebellitis as a complication of chicken-pox | 94 | — prophylactic inoculation | 96 |
| Cerebral (<i>see also</i> Brain) | | Cholesterol in beri-beri | 62 |
| — palsy due to intracranial birth injuries | 273 | — in blood (<i>see</i> Blood Cholesterol) | |
| — symptoms following erythema nodosum | 182 | — relation to remission of pernicious anaemia | 26 |
| Cerebrospinal fever | 87 | — values in diabetes | 142 |
| — — epidemiology | 87 | Cholesterosis of gall-bladder | 203 |
| — — symptoms and complications | 87 | Choleval in test for gonorrhoea | 225 |
| — — treatment | 88 | Chondroma, X-ray diagnosis of | 513 |

| | PAGE |
|--|------|
| Chorea | 98 |
| Chorion, perforation of uterus by, during pregnancy | 373 |
| Choriocarcinoma, radiotherapy in | 395 |
| Christian Science nursing homes, registration of | 336 |
| Chromium salts in sensitization of skin | 433 |
| — workers, perforation of nasal septum in | 332 |
| (Chromophobe cells in anterior lobe of pituitary) | 357 |
| Cibalgine as a substitute for opium | 353 |
| Cinchophen compounds, hepatitis due to | 284 |
| — in rheumatism and arthritis | 418 |
| Circulation of cerebrospinal fluid | 88 |
| Cirrhosis of liver, operative technique | 286 |
| Citrate effervescent alkalinizing salts for acidosis | 525 |
| Citrate of potassium in treatment of asdema due to acidosis | 354 |
| — sodium as a blood coagulant | 375 |
| Citrated blood, post-transfusion reactions and | 376 |
| — human plasma in hemophilia | 226 |
| — whole blood in hemophilia | 226 |
| (Citronella oil to keep off mosquitoes) | 305 |
| Clamps for hare-lip operations (<i>Figs. 32-34</i>) | 528 |
| (Claudication, intermittent) | 23 |
| Cleft palate (<i>see</i> Hare-lip and Left Palate) | |
| (Club-foot) | 102 |
| Coagulation of the blood | 275 |
| Cold-miner's lung, X-ray examination | 515 |
| Cobalt tannate in corned tattooing | 118 |
| Cocaine addiction in Egypt | 13 |
| — ointment in artificial silk conjunctivitis | 208 |
| — for pain of intrathoracic tumours | 198 |
| Coccidioid granuloma | 400 |
| (Coccidioides immitis) | 429 |
| Coccoreid X bodies of psittacosis | 388 |
| Cod-liver oil as an aid to calcium assimilation | 129 |
| — in hypoparathyroidism | 347 |
| — renal rickets | 411 |
| — rickets | 420 |
| — secondary anaemia | 299 |
| Coley's fluid in sarcoma of stomach | 449 |
| Colic, menstrual, contraception and | 371 |
| Colitis due to dental sepsis | 131 |
| Colitis, ulcerative | 104 |
| — incontinence of faeces in | 104 |
| — pathology | 104 |
| — treatment | 104 |
| Collapse of lung (<i>see</i> Lung, Massive Collapse of) | |
| — treatment in phthisis | 479 |
| Collip's parathyroid hormone, hypercalcaemia and | 346 |
| Colloidal copper in anaemia | 525 |
| Colon, cancer of | 106 |
| — constipation, diagnosis | 112 |
| — irrigation, continuous, in intestinal toxemia | 315 |
| — lavage in bacillary dysentery | 154 |
| — diverticulitis | 157 |
| — ulcerative colitis | 102 |
| Colon, multiple polyposis of | 105 |
| Colon, surgery of | 106 |
| — diverticulitis | 106 |
| — Hirschsprung's disease | 106 |
| — sigmoiditis | 107 |
| Colopecty for distended colon | 106 |
| Colostomy, after-care of | 106 |
| — in diverticulitis | 106 |
| — median, advantages of | 106 |
| — for strictures due to gonorrhoeal proctitis | 124 |
| Colsul in treatment of dementia paralytica | 221 |
| Coma, diabetic | 542 |
| Comb dissecting forceps, Salisbury's (<i>Fig. 74</i>) | 139 |
| Combined degeneration of corii, subacute, gastric defect and | 21 |
| Compensation for hernia due to accident | 238 |
| Coneslime in amebiasis | 17 |
| Congenital acholuric jaundice, splenectomy in | 445 |
| Congenital anorexia | 445 |

| | PAGE |
|--|------|
| Congenital auditory imperception .. | 60 |
| — hamolytic anemia .. | 18 |
| Congenital heart disease .. | 230 |
| Conjunctiva, diseases of .. | 107 |
| — — argyrosis .. | 107 |
| Conjunctivitis, artificial silk .. | 107 |
| — epidemic .. | 108 |
| — granular .. | 109 |
| — swimming baths and .. | 452 |
| — trichophytilides and .. | 428 |
| Constipation .. | 111 |
| — diagnosis .. | 111 |
| — treatment .. | 113 |
| Contact glasses in treatment of keratoconus .. | 371 |
| Contraception, maternal mortality and .. | 121 |
| Convulsions, ether .. | 37 |
| Copper, colloidal, in anaemia .. | 525 |
| — — coccidioidal granuloma .. | 100 |
| — in diet, dental caries and .. | 128 |
| — idiopathic secondary anaemia .. | 29 |
| — sulphate in erysipelas .. | 180 |
| — — renal actinomycosis .. | 265 |
| — — sycosis barbæ .. | 432 |
| — in trachoma .. | 111 |
| Cornea, diseases of .. | 114 |
| — — keratitis exfoliativa .. | 119 |
| — — — sicca .. | 120 |
| Corneal grafts .. | 114 |
| — — tattooing .. | 116 |
| — — ulcers due to Gasserian ganglion injections .. | 330 |
| — — — treatment by ultra-violet light .. | 118 |
| Corns, X-ray treatment of .. | 236 |
| Coronary arteries (<i>see also</i> Angina Pectoris) .. | 38 |
| — — eudarteritis obliterans of .. | 41 |
| — — occlusion, contrast with ordinary angina .. | 41 |
| — — thrombosis, electrocardiographic signs .. | 41 |
| — — heart-block in .. | 42 |
| — — X-ray examination .. | 40 |
| Coroners' cases and medico-legal work .. | 122 |
| Cortical abscess of kidney .. | 264 |
| — — tumours of suprarenal glands .. | 451 |
| Coryzal asthma in children .. | 57 |
| Crostan, a tin preparation for furunculosis .. | 535 |
| Cotton-seed and kapok sensitization of skin .. | 433 |
| Coxsackia due to gonococcal arthritis .. | 494 |
| Coxsackia as source of infection in tularemia .. | 490 |
| Creepling local anaesthesia .. | 9 |
| Cureiform support for operations on babies (<i>Fig. 64</i>) .. | 533 |
| Cryptococcemia, blastomycosis and .. | 429 |
| Cryptococcus, perleche due to .. | 431 |
| Cryptorchidism .. | 463 |
| Circulobiotrin in high blood-pressure .. | 73 |
| Culx fatigues, fluorisis and .. | 188 |
| — — in malaria .. | 304 |
| — — pignons in malaria .. | 304 |
| Cyanide of mercury in gonococcal epididymitis .. | 224 |
| — — poisoning .. | 122 |
| Cyclopropane in anaesthesia .. | 33 |
| Cyst, blue-domed, diagnosis by transillumination .. | 242 |
| — — cerebellar (<i>see</i> Lindau's Disease) .. | 363 |
| — — formation in pituitary tumours .. | 363 |
| — — of heel, treatment .. | 237 |
| Cystectomy in carcinoma of bladder .. | 67 |
| — — — — — ureteral transplantation and .. | 500 |
| — — papilloma of bladder .. | 66 |
| Cystic hygroma .. | 328 |
| — — of neck, thyrothymic lymph system and .. | 467 |
| — — mastitis, diagnosis by transillumination .. | 242 |
| Cystoscopy in tumours of bladder .. | 67 |
| — — — — — ureteral calculus .. | 498 |
| Cysts, bone, X-ray diagnosis of .. | 513 |
| — — as a cause of painful heels .. | 237 |
| — — dental, operative treatment .. | 340 |
| — — dermoid (<i>see</i> Dermoid Cysts) .. | 299 |
| — — hydatid, intrathoracic, symptoms of .. | 299 |

| | PAGE | | PAGE |
|---|----------|---|----------|
| Cyst, hydatid, intrathoracic, X-ray exam-ination | 296 | Diabetes, hæmochromatosis and | 141 |
| — mediastinal, in infants | 299 | — insipidus, 'pitressin' nasal jelly in | 527 |
| — solitary, of kidney | 267 | — oculomotor nerve paralysis in | 141 |
| DAKIN'S solution in pleurisy | 366 | — operative treatment | 147 |
| — technique for irrigation in gas gangrene | 208 | — pathology | 141 |
| — treatment in gonococcal infection of skin | 224 | — post-operative treatment | 147 |
| Deafness | 123 | — progressive insulin requirement in | 141 |
| — chronic, treatment of | 124 | — recovery from | 146 |
| — congenital word- | 60 | — surgery in | 148 |
| — degree of, and the tactile sense | 123 | — treatment | 142 |
| — in diagnosis of endothelioma of naso-pharynx | 326 | Diabetic coma | 533 |
| — of focal infective origin | 124 | Diagnostic and midwifery case | 516 |
| — localization of sound in | 123 | Diaphragm, X-ray examination of | 516 |
| Debility following erythema nodosum | 182 | Diastase content of blood and urine in dia-gnosis of pancreatitis | 344 |
| Debré's phenomenon | 307 | Diastolization in hypertrophic rhinitis | 333 |
| Débridement in treatment of gas gangrene | 208 | Diathermy | 150 |
| Decompression for cerebral tumours, tech-nique | 75 | — in anal fissure | 150 |
| — — — 'tumour' shift following | 75 | — carcinoma of vulva | 395 |
| Degeneration of cord, subacute combined, gastric defect and | 21 | — chronic deafness | 124 |
| Dehydration treatment of epilepsy | 178 | — during gall-bladder surgery | 205 |
| Delirium tremens, treatment | 11 | — in hygroma | 328 |
| Demodex folliculorum in skin diseases | 363 | — hypertrophic gingivitis | 217 |
| Dementia paralytica | 124 | — nasopharyngeal stenosis | 354 |
| — treatment with sulphur injectious | 124 | — papilloma of bladder | 150 |
| Dementia præcox | 125 | — pneumonia | 150 |
| — etiology | 125 | — puerperal septicæmia | 150 |
| — manganese chloride treatment | 516 | — strictures due to gonorrhœal proctitis | 221 |
| Dengue | 126 | — trachoma | 151 |
| Dental abscesses, apical, and infection | 132 | — tuberculous ulcers of tongue | 470 |
| Dental caries | 126 | — turbinal hypertrophy | 333 |
| — cysts, operative treatment | 540 | Diazo-colour reaction in uræmia | 404 |
| — extractions in cases of sepsis | 132 | Dick test for scarlet fever | 422 |
| — infective endocarditis | 174 | — toxin in scarlet fever immunization | 359 |
| Dental sepsis | 131 | Diencephalon, pituitary gland and | 406 |
| — factors influencing effects of | 131 | Diet in chronic nephritis | 553 |
| — mental diseases and | 315 | — correction of obesity | 106, 157 |
| — pathological effects | 131 | — in diverticulitis | 106, 157 |
| — secondary infections arising from | 132 | — dry, in chronic mucous gastritis in children | 44 |
| — as a source of infection | 132 | — in hepatitis after gall-bladder operations | 207 |
| — supervision of children in U.S.A. | 130, 134 | — high caloric, in secondary anæmia | 29 |
| Dentistry, children's | 134 | — in high blood-pressure | 73 |
| — in adenoid cases | 135 | — keratomalacia | 130 |
| — the importance of orthodontia | 135 | — lupus vulgaris | 361 |
| Dentistry, radiography in | 138 | — nephritis | 408 |
| Dentistry and radium | 138 | — nephrosis | 408 |
| Dentition, hypertrophic gingivitis and | 216 | — and prevention of dental caries | 127 |
| Dermatitis, arsenical, prevention of, in treat-ment of syphilis | 458 | — in pulmonary tuberculosis | 480 |
| — Berlock | 427 | — rheumatism and arthritis | 418 |
| — chronic, due to handling of radium | 398 | — secondary anæmia | 27 |
| — occupational, sensitivity tests | 432 | — sprue | 447 |
| — seborrhœic, organisms producing | 429, 430 | — ulcerative colitis | 101 |
| Dermatitis, skin sensitization in | 432 | Dietetics and pharmacy, progress of | 524 |
| Dermoid cysts, intrathoracic, operative treatment | 298 | Digestive disorders as cause of congenital anorexia | 44 |
| — — — symptoms | 294 | Digitalis, action upon the heart | 229 |
| — — — X-ray examination | 293 | — in embolism and phlebitis | 378 |
| Dextrose (<i>see also</i> Glucose) | | — leaf 'A & H' tablets | 525 |
| — in Addison's disease | 450 | — in myocardial insufficiency | 408 |
| — diphtheria | 154 | — nephritis | 408 |
| — for intraperitoneal therapy in children | 95 | — pneumonia | 368 |
| — in lupus erythematosus | 300 | Dilo oil, ethyl esters of, in treatment of leprosy | 278 |
| — pneumonia | 368 | Dimeplasmin in treatment of malaria | 306 |
| — venodolysis | 377, 378 | Dionin in after-treatment of corneal grafts | 116 |
| Diabetes | 140 | Diphtheria | 151 |
| — blood-cholesterol values in | 142 | — antitoxin for intraperitoneal therapy in children | 95 |
| — carbuncle and | 147 | — attributed to post-scarlatinal otorrhœa, legal decision re | 276 |
| — carcinoma of larynx and | 275 | — diagnosis | 153 |
| — clinical observations | 140 | — epidemiology | 151 |
| — complicating pulmonary tuberculosis | 140 | — laryngeal, tuberculosis after tracheotomy for | 152 |
| — diagnosis | 146 | — prophylaxis | 154 |
| — gangrene of the feet in | 141, 146 | — Schick test in | 153 |
| — glycogen deposits and | 141 | — spontaneous recovery from | 153 |
| | | — symptoms and complications | 151 |
| | | — treatment | 154 |

| | PAGE | | PAGE |
|---|----------|--|----------|
| Diplopia due to Gasserian ganglion injections | 330 | Electrocardiography in influenza | 245 |
| Directory, medical trades | 592 | — nitrous-oxide anaesthesia | 36 |
| — official and trades | 586, 592 | — non-rheumatic infections | 52 |
| Diuresis by ingestion of water, mechanism of | 409 | — paroxysmal tachycardia | 51 |
| Diuretics, selection of | 407 | — pericardial effusion | 51 |
| Diverticulation of the recti, reeding operation for (<i>Figs. 37, 38</i>) | 240 | Electrode, prostatic (<i>Fig. 110</i>) | 545 |
| Diverticulitis | 155 | — rectal (<i>Fig. 116</i>) | 547 |
| — etiology | 106 | Electrothermic desiccation in cancer of lip | 283 |
| — development of | 155 | Elephantiasis, filarial, failure of protein-shock treatment | 189 |
| — diagnosis | 156 | Elephantiasis of the lower extremities | 167 |
| — early | 106, 107 | Elixir sodium sulphocyanate in hypertension | 525 |
| — prognosis | 156 | — theophylline compound, indications | 525 |
| — treatment | 106, 157 | Embolism | 71 |
| — X-ray diagnosis | 157 | — operative technique | 71 |
| Dog rose in treatment of inguinal hernia | 238 | Embolism, paradoxical | 168 |
| Drainage in abscess of lung | 288, 290 | — post-operative | 378 |
| — (diverticulitis) | 106 | — pulmonary, operative treatment | 234 |
| — empyema | 169, 170 | — a precursor of paradoxical embolism | 169 |
| — hematoma of the auricle | 161 | Emesis gravidarum, venoclysis in | 377 |
| — osteomyelitis, methods of | 342 | Emetine in amoebiasis | 17, 18 |
| — pancreatitis | 344 | — amoebic liver abscess | 286 |
| — postural, in bronchiectasis | 84 | — bacillary dysentery | 159 |
| Dressings, wet, for superficial burns | 86 | — schistosomiasis | 425 |
| Dropsy of the labyrinth | 166 | Enge (Lumière), magnesium hyposulphite | 525 |
| Drug addiction | 12 | Emotions, primary, diencephalo-pituitary control of | 360, 362 |
| Drugs, action upon the heart | 229 | Empyema | 169 |
| — dangerous, legal decisions <i>re</i> register of | 276 | — as a complication of typhoid | 492 |
| Prummer's thumb | 463 | — importance of gradual decompression in | 508 |
| Ductus arteriosus, patent, historical survey and diagnosis | 231 | Encephalitic form of typhoid fever | 492 |
| — — — X-ray diagnosis | 235 | Encephalitis, epidemic | 171 |
| Duodenal niche, X-ray examination | 517 | — diagnosis | 172 |
| — ulcer (<i>see also</i> Gastric and Duodenal Ulcer) | 131 | — etiology | 171 |
| — — due to dental sepsis | 200 | — pregnancy and | 171, 172 |
| — — following a burn | 209 | — symptoms and complications | 171 |
| Duodenitis, histology | 209 | — treatment | 172 |
| Dupuytren-Bleuth-Partsch operation for dental cysts | 340 | — following chicken-pox | 94 |
| Dye workers, papilloma of bladder in | 66 | — post-vaccinal | 502 |
| Dyschezia, diagnosis | 112 | Encephalography | 513 |
| Dysenteries and predisposition to sprue | 447 | Encephalopathies in Addison's disease | 450 |
| Dysentery, amoebic | 16 | Endarteritis obliterans of coronary arteries | 41 |
| Dysentery, bacillary | 158 | Endocarditis due to dental sepsis | 131 |
| Dysgonia as a sequel of influenza | 246 | Endocarditis, subacute infective | 174 |
| Dysinsulinism | 143, 175 | — — danger of teeth extraction in | 174 |
| Dysmenorrhoea, ovarian hormone and | 343 | Endocrine (<i>see also</i> Parathyroid; Pituitary; Suprarenal; Thyroid) | |
| Dyspepsia | 159 | — secretions, influence of drugs on | 469 |
| — etiology | 159 | Endocrine tumours | 175 |
| Dysplasia, hereditary ectodermal | 237 | — — pancreatic tumours and hyperinsulinism | 175 |
| Dyspnoea, hydatid cyst rupture and | 295 | Endonasal method of operation on dental cysts | 340 |
| EAR conditions, bathing in relation to | 160, 452 | Endothelioma of nasopharynx | 326 |
| Ear, diseases of (<i>see also</i> Deafness) | 160 | — neck | 328 |
| — otosclerosis | 342 | — pleura, X-ray examination | 296 |
| — external, deformities of | 161 | Endotracheal insufflation in thoracic operations | 34 |
| — internal, labyrinthine affections | 166 | Enemas in diverticulitis | 158 |
| — — Ménière's syndrome | 166 | — fecal | 402 |
| — syphilis of | 167 | — ulcers | 101 |
| — malignant disease of | 160 | Entana | |
| — middle (<i>see</i> Otitis Media) | 160 | Ente | |
| Barache, reflex | 160 | Ente | |
| Bau d'Alibour in treatment of sycosis barbae | 432 | Ente | |
| Ectodermal dysplasia, hereditary | 237 | Ente | |
| Ectopia testis | 404 | Ente | |
| Eczema, blood-nitrogen and | 427 | Ente | |
| — disappearance of, following measles | 307 | Ente | |
| Eczema, skin sensitization in | 432 | Ente | |
| Eczema-asthma-prurigo syndrome in children | 57 | Ente | |
| Edentulous children, mouth-gag for (<i>Fig. 98</i>) | 543 | Ente | |
| Eggs, ducks', poisoning from | 190 | Ente | |
| Egyptian sydenomegaly | 446 | Ente | |
| Electrocardiography in acute rheumatism | 51 | Eos | |
| Electrocardiography, arrhythmia and | 49 | Eos | |
| — in coronary thrombosis | 41 | Eos | |
| — determination of electrical axis of heart | 52 | Eos | |
| — identification of rarer cardiac lesions | 52 | Eos | |

| | PAGE | | PAGE |
|---|----------|---|----------|
| Ephedrine, new preparation of | 526 | Exophthalmic goitre, thyroid gland sub- | |
| — in prevention of sudden fall of blood-pres- | | — stance in etiology | 467 |
| — sur | 507 | Explosibility of anaesthetics | 37 |
| — spinal anaesthesia | 31 | Extension apparatus for fractures (<i>Figs. 65,</i> | |
| — sulphate and spinal anaesthesia in treat- | | 66) | 533 |
| — ment of shock | 376 | — join (<i>Fig. 67</i>) | 534 |
| Epidemic conjunctivitis | 108 | Eye affections (<i>see also</i> Conjunctivitis; | |
| — encephalitis (<i>see</i> Encephalitis, Epidemic) | | — Cornea; Glaucoma; Retinal) | 185 |
| Epidemic enteritis | 177 | — — malignant intra-ocular tumours, ra- | |
| Epididymitis, suppurative, foudculitis and .. | 221 | — dium treatment | 185 |
| Epigastric fatty hernia | 239 | Eye instrument grip (<i>Fig. 68</i>) | 534 |
| Epilepsy | 177 | — pyogenic infections of, local vaccine treat- | |
| — as a complication of epidemic encephalitis | | — ment in | 393 |
| — in diagnosis of head injuries | 323 | Eyelid retractor (<i>Fig. 69</i>) | 534 |
| — due to intracranial birth injuries | 272 | | |
| — 'hydration factor' in | 178 | | |
| — influenza in amelioration of | 246, 319 | F | |
| — neurosomatic deterioration | 177 | FACE-PIECE , all-rubber (<i>Fig. 70</i>) | 534 |
| — treatment by dehydration | 178 | Facial paralysis | 185 |
| Epinalin, a solution of adrenalin and ephedrine | | — — due to Gasserian ganglion injections | |
| — sulphate | 526 | Faecal incontinence due to intracranial birth | |
| Epinephrin, anginal symptoms induced by .. | 40 | — injuries | 272 |
| — in control of insulin sensitization | 149 | Faecal tumours | 462 |
| — dysidrosis | 145 | Fainting, heart efficiency and | 232 |
| — gold chloride tattooing of cornea | 117 | Faradic current in treatment of aphonia .. | 273 |
| — polymycolitis | 370 | Fascial grafts (<i>Figs. 9-13</i>) | 187 |
| Epiphysis of first metatarsal, aseptic necrosis in | | — — in facial paralysis | 186 |
| — lesser trochanter, separation of | 511 | — — fractures of patella (<i>Figs. 29-31</i>) .. | 201 |
| Epistomy in prophylaxis of intracranial | | Fat metabolism, pituitrin and | 359, 362 |
| birth injuries due to prematurity | 272 | — — xanthoma and | 510 |
| Epistaxis | 334 | Fat necrosis of breast | 79 |
| Ergosterol, irradiated, in food | 199 | Fat-soluble A deficiency and dental caries .. | 127 |
| — — relief of hyperparathyroidism | 347 | Fatty acids, relation to remission of pernicious | |
| — — rickets | 419 | — anemia | 26 |
| — — sprue | 447 | Favus on penis and scrotum | 429 |
| Ergotamine tartrate, anginal symptoms in- | | Femoral vein, embolism and | 378 |
| duced by | 40 | — — ligation of, in thrombo-angitis obli- | |
| Erysipelas | 179 | — terans | 466 |
| — following operation on nasal septum | 332 | Femur, fractures of neck of, abduction treat- | |
| — local vaccine treatment in | 393 | — ment | 198 |
| — scarlet fever and immunity to | 421 | — — — open operation for (<i>Figs. 23-28</i>) .. | 199 |
| — symptoms and complications | 179 | — — injuries of greater trochanter, X-ray | |
| — treatment | 179 | — diagnosis | 511 |
| Erythema | 180 | — separation of epiphysis of lesser tro- | |
| — as a complication of cerebrospinal fever | | chanter, X-ray diagnosis | 511 |
| — elevatum uterinum | 181 | Ferrieyanide of potassium in treatment of | |
| — exudativum multiforme, etiology | 180 | — argyrosis of conjunctiva | 107 |
| Erythema infectiosum | 181 | Fever treatment of neurosyphilis | 460 |
| Erythema nodosum | 182 | Fibrillation, auricular (<i>see</i> Auricular Fibril- | |
| — — as a sequel of influenza | 246 | — lation) | |
| — from superficial burns, treatment | 86 | Fibroids, radium treatment in | 395 |
| Erythraemia | 182, 522 | Fibrolysin in treatment of keratitis sicca .. | 120 |
| Erythroblastæmia of infants | 19 | Fibroma as loose body in knee-joint | 268 |
| Escherichia in tonsillar factor | 471 | — of tendon and tendon-sheath | 463 |
| Eserine and glaucomas in glaucoma | 219 | Fibromyoma, radium treatment in | 395 |
| Ether anaesthesia in hyperinsulinism with | | Fibrosarcoma of thyroid | 469 |
| — pancreatic tumour | 176 | Fibrositis | 414 |
| — in burns | 86 | — pulmonary, asbestos workers and .. | 242 |
| — convulsions | 37 | Fibrous prostate | 382 |
| — effect on kidney secretion | 35 | Fiaria bancrofti | 189 |
| — per recurrent | 35 | — — calcified, X-ray diagnosis | 521 |
| Ethyl chloride | 35 | Filariasis | 188 |
| — — — — — for | 38 | Finger-nails, split (<i>Fig. 15</i>) | 189 |
| — — — — — | 244 | Finsen treatment of lupus vulgaris | 300 |
| — — — — — | 34 | Fischer's solution in venoclysis | 377 |
| — — — — — | 35 | Fistula, abdominal, kaolin powder for .. | 10 |
| — — — — — | 37 | — arteriovenous, surgery of | 69 |
| — — — — — | 366 | — due to treatment of ischio-rectal abscess | |
| — — — — — | 526 | — gastrojejunocolic, after gastro-enteros- | |
| — — — — — | 183 | — tomy for ulcer | 214 |
| — — — — — | 408 | — persistent bronchial, treatment | 289 |
| — — — — — | 167 | — rectal, perineal prostatectomy and .. | 382 |
| — — — — — | 93 | Fixation abscesses in treatment of epilepsy | |
| — — — — — | 289 | — due to epidemic encephalitis | 172 |
| — — — — — | 184 | Flat-foot, rigid, operative treatment | 192 |
| — — — — — | 140 | Flavine in burns near rectum | 86 |
| — — — — — | 119 | Flics in etiology of epidemic enteritis .. | 177 |
| — — — — — | 49 | Flocculation tests for syphilis | 453 |
| — — — — — | | Flow-meter for administration of gas and | |
| — — — — — | | — oxygen (<i>Fig. 1</i>) | 36 |
| — — — — — | | Focal infection as a cause of deafness .. | 124 |

| | PAGE | | PAGE |
|---|----------|--|------------|
| Pectal lobulation, aberrant blood-vessels and | 259 | Gall-stones, blood-cholesterol and | 286 |
| Factor, tonsillar, bacteriology | 471 | Galvanocautery in tuberculosis of larynx | 273 |
| Pectus, effect of irradiation of ovaries on | 374 | Ganglion, Gasserian, injections in trigeminal neuralgia | 329 |
| Food and the public health | 190 | — stellar, excision in mitral stenosis | 324 |
| — — — botulism | 191 | Ganglionectomy, lumbar sympathetic, in thrombo-angitis obliterans | 466 |
| — — — irradiated ergosterol | 190 | — thoracic and lumbar sympathetic, in peripheral vascular diseases | 70 |
| — — — poisoning from ducks' eggs | 190 | Gangrene of feet in diabetes | 141, 146 |
| — — — vitamin content of honey | 191 | Gas gangrene | 207 |
| — — — vitamin D | 190 | Gas-oxygen anaesthesia, flow-meter for (<i>Fig. 1</i>) | 36 |
| Foot, gangrene of, in diabetes | 141, 146 | — — — for thoracoplasty in phthisis | 483 |
| — pain, treatment | 193 | Gaseous anaesthetics, effect on blood acidity | 35 |
| — ringworm of | 428 | Gasserian ganglion injections in trigeminal neuralgia | 329 |
| — support, the 'Reality' vulgus sole (<i>Fig. 71</i>) | 535 | Gastroctomy for duodenal ulcer | 212, 213 |
| Foot, surgery of | 192 | — perforated ulcer | 215 |
| — — — club-foot | 192 | — Polyá, for sarcoma of stomach | 449 |
| — — — rigid flat-foot | 192 | Gastric (<i>see also</i> Stomach) | |
| Forceps, abdominal, Miles's (<i>Fig. 72</i>) | 535 | Gastric analysis | 208 |
| — capsule, Alexander's (<i>Fig. 73</i>) | 535 | — contents, examination of, in mental diseases | 25 |
| — comb dissecting, Salisbury's (<i>Fig. 74</i>) | 535 | — — free hydrochloric acid in, effect on pernicious anaemia of pregnancy | 25 |
| — — — hernia, Buckley's (<i>Fig. 75</i>) | 536 | — — hypo-acidity of, gall-bladder infection and | 285 |
| — — — radium needle (<i>Figs. 76, 77</i>) | 536 | Gastric and duodenal ulcer (<i>see also</i> Duodenal Ulcer) | 209 |
| — — — tissue, Taylor's (<i>Fig. 78</i>) | 536 | — — — insurance risk | 209 |
| — — — towel-holding, Mason's (<i>Fig. 79</i>) | 536 | — — — perforated, after-cure | 215 |
| — — — towel-holding, Higgs's (<i>Fig. 80</i>) | 537 | — — — diagnosis | 214 |
| — — — universal catch, Taylor's (<i>Fig. 81</i>) | 537 | — — — end-results of operation | 211, 214 |
| — — — uterine fixation (<i>Fig. 82</i>) | 537 | — — — operative methods | 215 |
| — — — vasostomy (<i>Fig. 83</i>) | 537 | — — — relation to cancer | 209 |
| — — — vulsulum, Douglas's (<i>Fig. 84</i>) | 537 | — — — statistics | 209 |
| Foreign bodies in the oesophagus and bronchi | 193 | Gastric and duodenal ulcer, surgery of | 209 |
| — — — trachea | 473 | — — — methods | 210 |
| Fontain in treatment of schistosomiasis | 425 | — — — sequele | 214 |
| Fontaineau 309 in treatment of trypanosomiasis | 475 | — dysfunction, mental diseases and | 315 |
| Fractures | 194 | — juice, pernicious anaemia and | 20, 21, 24 |
| — — — extension apparatus for (<i>Figs. 65, 66</i>) | 533 | — operations, recurrent ulcer after | 213 |
| — of heel bone | 202 | — — tissue, eugastrol 'A & H' | 526 |
| — of femur neck | 198 | — ulcer due to dental sepsis | 131 |
| — of patella (<i>Figs. 29-31</i>) | 201 | Gastritis, chronic, failure of gastric operations due to | 213 |
| — of pelvis (<i>Figs. 21, 22</i>) | 197 | — — — mucous, in children | 44 |
| — of leg, traction frame for (<i>Figs. 140, 141</i>) | 553 | — — — as a complication of typhoid fever | 492 |
| — pseudo- | 512 | — — — from dental sepsis | 131 |
| — of skull | 320 | Gastro-enterostomy for ulcers | 210 |
| — spine | 442 | — — — end-results | 211 |
| — treatment by skeletal traction | 194 | Gastro-intestinal disorders following erythema nodosum | 182 |
| Fret's antigen in diagnosis of lymphogranulomatosis inguinallis | 93 | — — — hyperparathyroidism and | 346, 347 |
| Fresh-air treatment of secondary anaemia | 27 | — — — in pernicious anaemia | 20 |
| Fructosuria | 149 | — — — swimming baths and | 451 |
| Fungous infections of skin (<i>see</i> Skin) | | — tract, dyspepsia and | 159 |
| Puricular mycosis, gastric defect in etiology | 21 | — — — infection due to achlorhydria | 131 |
| Purcellitis, suppurative epididymitis and | 221 | — — — X-ray examination of | 517 |
| Purpurosis, costari, a tin preparation for | 525 | Gastrojejunoileic fistula after gastro-enterostomy for ulcer | 214 |
| — local vaccine treatment in | 393 | Gastrojejunoostomy for perforated ulcer | 215 |
| — recurrence of, due to dental sepsis | 132 | Gastrophotography | 210 |
| (*) Act and tongue depressor, Milton's | 538 | Gastroptosis, ill effects of | 448 |
| Gahetagnog, pluritrin as | 359 | — — — operative technique | 449 |
| Gall-bladder (<i>see also</i> Cholecystitis) | | Gastrosopy | 210 |
| — cancer of | 207 | Gautcher's disease, bone changes in, X-ray diagnosis | 512 |
| — infection, diagnosis and treatment | 285 | — — — splenectomy in | 446 |
| — — hepatitis and | 284 | Gautcher's splenomegaly in infancy | 216 |
| — — hypo-acidity of gastric contents and | 286 | German measles | 420 |
| — — lipidol in X-ray examination | 518 | Chidness in diagnosis of head injuries | 323 |
| Gall-bladder, surgery of | 203 | Chigantism | 357 |
| — — — cholecystenterostomy for chronic jaundice | 205 | Gingivitis, hypertrophic | 216 |
| — — — cholecystogastrostomy for cholecystitis | 205 | Glanders | 217 |
| — — — cholecystostomy | 203 | Glandular fever | 217 |
| — — — choledochoduodenostomy | 205 | — — — diagnosis | 218 |
| — — — choledochotomy | 205 | — — — epidemiology | 217 |
| — — — post-operative troubles | 207 | | |
| — — — reconstruction of bile-ducts | 205 | | |
| — — — statistics | 206 | | |
| — — — technique | 204 | | |
| — — — visualization of bile-passages | 203 | | |

| | PAGE | | PAGE |
|---|----------|---|----------|
| Glandular fever, symptoms and complications | 218 | H ÆMANGIOMA of bone, X-ray diagnosis .. | 512 |
| Glaucoma | 218 | — tendon and tendon-sheath .. | 463 |
| — diagnosis of early stages | 218 | Hæmatemesis with splenomegaly, splenectomy in | 446 |
| — importance of gradual decompression in .. | 507 | Hæmatocolpos, importance of gradual decompression | 507 |
| — treatment | 219 | Hæmatoma of auricle, treatment | 161 |
| Glaucomas in treatment of glaucoma | 219 | — septal, as complication in operations on nasal septum | 332 |
| Glioma, intra-ocular, radium treatment .. | 185 | Hæmatoma, spontaneous, of rectus abdominis | 225 |
| Gliomas of brain, hæmorrhage into | 248 | Hæmaturia complicating insulin treatment .. | 149 |
| Glomerulonephritis, acute, natural history .. | 404 | — essential | 262 |
| — pathogenesis | 403 | Hæmochromatosis and diabetes | 141 |
| (Glucose (<i>see also</i> Dextrose)) | | Hæmoglobinuria complicating chicken-pox .. | 94 |
| — absorption per rectum | 352 | Hæmoglobinuria in new-born | 380 |
| — in asthma | 59 | Hæmolytic anæmias in infants and children .. | 18 |
| — as a blood-coagulant | 375 | — jaundice, reticulocytosis and splenectomy .. | 251 |
| — in diabetic coma | 143 | Hæmophilia | 226 |
| — enema, bacterial fermentation and | 352 | Hæmoptysis as a symptom of intrathoracic growth | 294 |
| — blood-sugar level and | 352 | Hæmorrhage complicating quinsy | 354 |
| — method of uptake | 352 | — cutaneous and subcutaneous, in erythema infectiosum | 182 |
| — in hæmorrhage into glioma of brain .. | 249 | — following prostatectomy, causes of | 384 |
| — hyperinsulinism | 144 | — intermenstrual, abortion and | 371 |
| — ileus | 247 | — intestinal, in typhoid fever of infants .. | 492 |
| — for intravenous administration | 526 | Hæmorrhage, intracranial | 247 |
| — isotonic, alcohol in, as intravenous anæsthetic | 37 | — from nipple in breast tumours | 80 |
| — in post-operative treatment of diabetes .. | 148 | — nose | 354 |
| — tolerance test, glycogenetic function of liver and | 285 | — thromboplastin brain tissue in | 529 |
| — in varicose veins | 505 | — from uterus, radium treatment | 395 |
| Glycerin in follicular tonsillomyositis .. | 470 | Hæmorrhoid injection instrument (<i>Fig. 88</i>) .. | 538 |
| — hydrocele | 464 | Hæmorrhoidal speculum and case (<i>Figs. 128, 129</i>) | 549 |
| Glycogen deposits, diabetes and | 141 | Hæmorrhoids | 226 |
| Glycosuria (<i>see also</i> Diabetes) | | Hæmostasis in mastoid operations | 164 |
| — hyperpituitarism and | 359 | Hæmostatic bag (<i>Fig. 89</i>) | 539 |
| Glycythymoline in treatment of chronic mucous gastritis in children | 44 | — clamp for hare-lip operations (<i>Fig. 32</i>) .. | 228 |
| Goitre | 219, 467 | Härtel's technique in Gasserian ganglion infection | 329 |
| — exophthalmic, subtotal thyroidectomy in .. | 219 | Hair, abnormalities of, in hypertrophic gingivitis | 217 |
| — thyroid gland substance in etiology of .. | 467 | Hallux rigidus and valgus | 227 |
| — intrathoracic, operative treatment | 298 | Halometer in diagnosis of pernicious anæmia .. | 41 |
| — parenchymatous, thyroid extract in treatment of | 469 | Hand, extensor tendon of, injuries to | 262 |
| — retractor (<i>Fig. 87</i>) | 538 | Hare-lip and cleft palate | 228 |
| — retrosternal, operative technique | 220 | — — — alveolar wiring in, condemnation of .. | 228 |
| Gold chloride in corneal tattooing | 117 | — — — instruments used in operation (<i>Figs. 32-35</i>) | 228 |
| — salts in lupus erythematosus | 300 | — — — operative technique | 229 |
| — trachoma | 110 | — — — speech education after operation | 229 |
| Goldberger's method of vaccination | 501 | Harmaline in post-encephalitic conditions .. | 174 |
| Gonemol oil in adenoiditis in measles epidemic | 307 | Harmaline in post-encephalitic Parkinsonism .. | 173 |
| — and olive oil in producing oleothorax .. | 366 | Hashish addiction in Egypt | 13 |
| Gonococcal arthritis, classification | 222 | Hay asthma in children | 57 |
| — of hip-joint | 223 | Hay fever | 57 |
| — treatment | 223, 224 | — — — adrephine Rx. 'B' in | 524 |
| — infections, abdominal adhesions due to .. | 223 | — — — hereditary factor in | 57 |
| — of skin | 224 | — treatment | 59 |
| — proctitis | 221 | Head injuries, diagnosis of | 322, 323 |
| Gonorrhœa | 220 | — — — mental and nervous sequelæ of | 322 |
| — purulent orchitis in | 222 | Headache in diagnosis of head injuries .. | 323 |
| — serum diagnosis | 220 | — following lumbar puncture, etiology | 89 |
| — tests of cure | 225 | — menopausal, thyroid extract in | 469 |
| — treatment | 224 | Hearing tests | 123 |
| Gonovitan in gonorrhœa | 225 | Heart (<i>see also</i> Cardiac; Electrocardiography) | |
| Gould's amputation in cancer of penis .. | 350 | Heart, action of drugs upon | 229 |
| Gout | 414 | Heart disease, congenital | 230 |
| Grafts, corneal | 114 | Heart disease, syphilitic | 231 |
| — fascial (<i>see</i> Fascial Grafts) | | — — — electrocardiography in | 232 |
| Graham test in cholecystography, accuracy of | 204 | — electrical axis of, electrocardiographic determination of | 52 |
| Granular conjunctivitis | 109 | — electrocardiography in nitrous-oxide anæsthesia | 36 |
| Granuloma annulare | 181 | Heart, estimation of efficiency of | 232 |
| Granuloma, coccidioidal | 100, 430 | Heart failure | 233 |
| — inguinale, likeness to chancreoid | 93 | — — — under anæsthesia | 35 |
| Graves' disease, subtotal thyroidectomy in .. | 219 | — — — in beri-beri, cause of | 62 |
| — thyroid gland substance in etiology of .. | 467 | | |
| Guaiaic, bicolour, test on cerebrospinal fluid .. | 92 | | |
| Guilloine, tonsil, La Forge's (<i>Fig. 138</i>) .. | 552 | | |
| Gymnastic apparatus for prevention of post-operative thrombosis | 538 | | |
| Gynæcology, radium in (<i>see</i> Radium) | | | |

| | PAGE | | PAGE |
|---|----------|--|---------------|
| Heart failure, measurement of congestion .. | 233 | Hydrazine hydrate in silver tattooing of cornea .. | 118 |
| — — symptoms .. | 233 | Hydriol, a new iodized oil for use in bronchography, etc. .. | 526 |
| Heart and pericardium, surgery of .. | 233 | Hydrocele, injection treatment .. | 464, 506 |
| — — — cardiolysis .. | 233 | — — traumatic .. | 464 |
| — — — embolism of pulmonary artery .. | 234 | Hydrocephalus following operation for spina bifida .. | 440 |
| — — — pericarditis, acute .. | 233 | Hydrochloric acid and calcium chloride in tetany .. | 348 |
| — — — chronic .. | 234 | — — in gastric contents, effect on pernicious anaemia of pregnancy .. | 25 |
| — — — pneumopericardium .. | 234, 516 | — — sprue .. | 446, 447, 448 |
| Heart in relation to surgical operations .. | 235 | Hydrocyanic acid for pain due to intrathoracic tumours .. | 298 |
| Heart, X-ray appearances .. | 235, 516 | Hydrogen dioxide irrigation in gas gangrene .. | 208 |
| Heart-block, clinical features .. | 50 | — peroxide in chancreoid .. | 93 |
| — in coronary thrombosis .. | 42 | Hydro-mycelo-meningocele, classification and pathology .. | 437 |
| — right branch bundle, clinical significance .. | 51 | Hydronephrosis .. | 261 |
| Heel bone, fractures of .. | 202 | — nephrectomy and .. | 261 |
| Heels, painful (Fig. 36) .. | 236 | — operative technique .. | 261 |
| Heliotherapy in pulmonary tuberculosis .. | 355 | — supernumerary kidney and .. | 260 |
| — renal rickets .. | 411 | Hydrostatic establishments .. | 580 |
| — undulant fever .. | 497 | Hydrostatic suction pump (Fig. 90) .. | 539 |
| Heminephrectomy .. | 261 | Hygroma, cystic .. | 328 |
| Hepatic (<i>see also</i> Liver) | | — — of neck, thyrothymic lymph system and .. | 467 |
| — shock due to sudden visceral decompression .. | 507 | Hymen, imperforate, importance of gradual decompression in .. | 507 |
| Hepatitis, amoebic .. | 17 | Ityosine in post-encephalitic Parkinsonism .. | 174 |
| — due to cinchophen compounds .. | 284 | Hypercalcaemia, Collip's parathyroid hormone and .. | 346 |
| — gall-bladder infection and .. | 284 | Hyperchlorhydria, mental diseases and .. | 315 |
| Hereditary aspect of achlorhydria in pernicious anaemia .. | 21 | Hyperemesis gravidarum, method of uptake of glucose enema in .. | 352 |
| Hernia .. | 238 | Hyperinsulinism .. | 143 |
| — of bladder .. | 64 | — clinical observations .. | 143 |
| — causation .. | 238 | — low blood-sugar and .. | 143, 176 |
| — diaphragmatic .. | 239 | — pancreatic tumours and .. | 175 |
| — epigastric, fatty .. | 239 | — treatment with glucose .. | 144 |
| — forceps, Buckley's (Fig. 75) .. | 356 | Hyperkeratosis and precancerous larynx .. | 275 |
| — inguinal .. | 238 | Hyperparathyroidism .. | 345 |
| — — massive collapse of lung after operation for .. | 379 | — calcium content in blood and .. | 345-347 |
| — post-operative, in gall-bladder operations .. | 207 | — osseous changes and .. | 345 |
| — resulting from accident, compensation for .. | 238 | — symptoms and diagnosis .. | 347 |
| Heroin addiction in Egypt .. | 13 | — tetany following operative treatment .. | 346, 347 |
| Herpes zoster, blood-serum treatment of .. | 240 | Hyperpiesia (see Blood-pressure, High) | |
| — complicating epidemic encephalitis .. | 172 | Hyperpyrexia in early infancy due to atropine .. | 241 |
| Isoxyl-resorcinol, sterilization of skin and .. | 375 | Hypertension, elixir sodium sulphocyanate in .. | 525 |
| Itchy rubber bag in excretion urography .. | 519 | — — paroxysmal, associated with suprarenal tumour .. | 451 |
| Itip-joint, gonococcal arthritis of .. | 223 | Hypertrophic bulism (<i>see also</i> Goitre) | |
| — tuberculosis of .. | 486 | — — angina pectoris and .. | 42 |
| Jirschung's disease .. | 106 | — — complications .. | 468 |
| Histamine and adrenalin compounds in glaucoma .. | 219 | — — pathology .. | 467 |
| — in gangrene of feet in diabetes .. | 141 | — — signs and symptoms .. | 467 |
| Hodgkin's disease, blood-picture in .. | 303 | — — treatment .. | 468 |
| Hog's stomach, preparation of, in pernicious anaemia .. | 24, 529 | Hypertonic solutions in head injuries .. | 323 |
| Holarrhena antidiysenterica in amebiasis .. | 17 | Hypertrophic gingivitis .. | 216 |
| Homicidal tendency in diagnosis of head injuries .. | 323 | Hyperventilation with carbon dioxide in collapse of lung .. | 282 |
| Honey, vitaminus in .. | 191 | — — spiogram showing effect on respiration (Fig. 41) .. | 293 |
| Hookworm disease .. | 43 | Hyphomycetes, Coccidioides immitis and .. | 430 |
| Hormone, Collip's parathyroid, hypercalcaemia and .. | 346 | Hypnotic suggestion in alcoholism .. | 10, 11 |
| — — female sexual, progyon .. | 527 | Hypocholesteria, asthma in children and .. | 57 |
| Hormones (<i>see also</i> Ovarian Hormones) | | Hypoglycaemia associated with encephalopathies in Addison's disease .. | 450 |
| — produced by basophil cells of pituitary .. | 357 | — hyperinsulinism and .. | 143 |
| Horse serum in gas gangrene .. | 208 | Hypoparathyroidism due to lobectomy .. | 347 |
| Horsley's wax in treatment of hallux rigidus .. | 227 | — otosclerosis due to .. | 342 |
| Humerus, ossifying epiphysium of, X-ray diagnosis .. | 511 | — symptoms .. | 347 |
| Hurst's method in spasmodic torticollis .. | 472 | Hypothyroidism .. | 468 |
| Hydatid cyst, intrathoracic, symptoms .. | 295 | Hypotonia, muscular, in diagnosis of hyperparathyroidism .. | 346, 347 |
| — — treatment .. | 298, 299 | Hysterosalpingography .. | 520 |
| — — X-ray examination .. | 296 | | |
| Hydrocarpus wightiana in leprosy .. | 278 | | |
| Hydrumms, importance of gradual decompression in .. | 507 | | |
| * Hydration factor' in epilepsy .. | 178 | | |
| Hydrazine hydrate in platinum chloride tattooing of cornea .. | 117 | | |

| | PAGE | | PAGE |
|---|------|---|------------|
| ICE in post-operative salivary-gland infections | 380 | Insulin in pernicious anaemia | 24 |
| I diopathic anaemia, iron and copper in | 29 | — pulmonary tuberculosis complicating diabetes | 140 |
| I gnipuncture of retina (<i>Fig.</i> 48) | 412 | — use in non-diabetics | 143 |
| I leocecal valve, glucose enema and | 352 | I nsulin-resistant diabetes | 140 |
| I leostomy in bacillary dysentery | 159 | I nsurance of ulcer patients | 209 |
| I leus, paralytic, due to ureteral calculus | 499 | I nter-marriage and dementia præcox | 125 |
| — spinal analgesia for | 32 | I nter-menstrual hæmorrhage, abortion and | 371 |
| — spinoecain injection for | 32 | I ntervertebral discs, injuries to | 444 |
| — physiology of | 246 | — X-ray diagnosis and | 513 |
| — spastic | 247 | I ntestinal obstruction (<i>see also</i> I leus) | 246 |
| — treatment | 246 | — enterospasm | 247 |
| I liac glands, suppurating deep | 10 | — importance of gradual decompression | 507 |
| — vein, embolism and | 378 | — pernicious anaemia due to | 20 |
| I llumination and transillumination | 241 | I ntestine, small, cancer of | 247 |
| I mmunized blood in desensitization to dental sepsis | 152 | I ntestines, rupture from compressed air | 247 |
| I mperception, congenital auditory | 60 | I ntestines, surgical affections of | 247 |
| I ndican determination of blood in renal insufficiency | 495 | I ntra-cranial birth injuries | 272 |
| I ndustrial diseases | 242 | — calcifications, X-ray diagnosis | 514 |
| — arsenical poisoning from sheep-dipping | 243 | I ntra-cranial hæmorrhage | 247 |
| — artificial silk conjunctivitis | 107 | — pressure after spinal analgesia | 33 |
| — coal-miner's lung | 515 | — trauma, still-born children and | 272 |
| — ethyl petrol and lead poisoning | 244 | — tumours (<i>see</i> B rain, T umours of) | |
| — occupational cancer | 243 | I ntra-peritoneal therapy in children | 95 |
| — dermatitis, sensitivity tests | 432 | I ntra-thoracic tumours (<i>see</i> L ung and M ediastinum, T umours of) | |
| — papilloma of bladder in dye workers | 66 | I ntravenous injection, calcium chloride solution for | 525 |
| — pulmonary asbestosis | 51 | — glucose for | 526 |
| I nebriates, institutions and homes for | 576 | — uritone (hexamine) solution for | 529 |
| I nfant food, a new, vitasac | 529 | — transfusion solutions and apparatus (<i>Fig.</i> 54) | 526 |
| — mortality, post-war, statistics | 272 | I ntroduction | 1 |
| I nfants (<i>see also</i> C hildren; N ew-born) | | I ntubation in carcinoma of œsophagus | 338 |
| I nfants, anaemia in: liver therapy | 15 | I odide of potassium in after-treatment of corneal grafts | 116 |
| — Gaucher's splenomegaly in | 216 | — post-operative treatment of renal actinomycosis | 265 |
| I nfants, hyperpyrexia due to atropine in | 241 | — sodium ammonia in intravenous urography | 258 |
| — mediastinal cysts in | 299 | I odides of bismuth in amoebic dysentery | 17 |
| — operations on, cruciform support for (<i>Fig.</i> 64) | 533 | — in diagnosis of lesions of larynx | 274 |
| — typhoid fever in | 491 | — tonsillomycosis | 471 |
| I nfantilism, anterior lobe of pituitary and | 358 | I odine in chancreoid | 93 |
| — renal | 409 | — coccidioidal granuloma | 430 |
| I nfection from books | 244 | — container, pocket (<i>Fig.</i> 108) | 544 |
| I nfective hæmolytic anaemia | 18 | — in follicular tonsillomycosis | 470 |
| I nfective jaundice | 251 | — hygroma | 328 |
| I nfluenza | 245 | — hyperthyroidism | 468 |
| — angina pectoris and | 42 | — keratitis exfoliativa | 119 |
| — epidemiology | 245 | — membranous tonsillomycosis | 470 |
| — mental diseases and | 315 | — mercury pigmentation | 427 |
| — quinsan in | 528 | — post-operative paroxysmal auricular fibrillation | 49 |
| — relation to exanthema subitum | 184 | — salivary-gland infections | 380 |
| — symptoms and complications | 245 | — sterilization of skin and | 374 |
| I nframaxillary pain, left, and angina pectoris | 42 | — in syphilis bulbar | 432 |
| I nguinal hernia | 238 | — tonsillomycosis | 471 |
| I nhaler for open ether administration (<i>Fig.</i> 91) | 539 | I odized bismuth gauze pack in operation for empyema | 170 |
| I nhaling apparatus, oxygen, portable (<i>Fig.</i> 104) | 543 | — boric acid insufflations in otitis media | 162 |
| I ncubation for asthma and hay fever | 59 | — oil in bronchiectasis | 84 |
| — against cholera | 96 | I odoform in aspiration treatment of empyema in children | 170 |
| — with typhus blood in prophylaxis of typhus fever | 495 | — leprous ulcers | 278 |
| I nstitutions certified under Mental Deficiency Act, 1913 | 573 | I ron in achlorhytric anaemia | 28 |
| — for inebriates | 576 | — anaemia of infants and children | 18, 19 |
| — mental treatment | 566 | — kala-azar | 256 |
| — nursing | 581 | — undernutrition | 28 |
| — special care and treatment | 581 | — colloidal, for intra-peritoneal therapy in children | 95 |
| I nsulin (<i>see also</i> H yperinsulinism) | | — in diet, dental caries and | 128 |
| — in Addison's disease | 450 | — secondary anaemia | 27, 29, 30 |
| — anginal symptoms induced by | 40 | — sulphate in corneal tattooing | 117 |
| — in diabetes | 148 | I ron-hæmatoxylin staining of malarial parasites | 305 |
| — progressive requirement of | 141 | I rrigation in hepatitis following gall-bladder operations | 207 |
| — diabetic coma | 142 | | |
| — diptheria | 154 | | |
| — noxious side-effects of | 149 | | |

| | PAGE | | PAGE |
|---|----------|---|---------|
| Irrigation, tidal, in empyema | 169 | LABOUR and its complications | 268 |
| Ischiorectal abscess | 249 | — — — intracranial birth injuries .. | 272 |
| Ispaghula in bacillary dysentery .. | 159 | — — — occipito-posterior presentations .. | 269 |
| | | — — — pituitary extract in | 271 |
| JACKSON'S (von) anemia | 19 | — — — placenta previa | 268 |
| Jaundice, acholuric, in infants and | | — — — Opojex's ovarian residue in .. | 527 |
| children | 18 | — — — thyrophysin in | 529 |
| — — — congenital, splenectomy in .. | 115 | — — — nitrous-oxide anaesthesia in .. | 36 |
| — — — chronic, cholecystenterostomy for .. | 205 | Labyrinthine affections | 166 |
| — — — due to cancer of head of pancreas .. | 345 | Lactic acid treatment of spring catarrh .. | 108 |
| Jaundice, hæmolytic | 251 | Laminectomy in spasmodic torticollis .. | 472 |
| Jaundice, infective | 251 | Lamp black in corneal tattooing .. | 118 |
| Jaw, lower, fractures of | 359 | Langenbeck-Ferguson technique for cleft | |
| — — — upper, cysts of, operative treatment .. | 349 | palate | 229 |
| — — — X-ray examination | 186 | Larvicides in prophylaxis of malaria .. | 304 |
| Jejunostomy as post-operative measure in | | Laryngectomy in carcinoma of larynx .. | 275 |
| gall-bladder operations | 207 | Laryngitis, staphylococcal, simulating laryn- | |
| Juvenile (<i>see also</i> Children; Infants; New- | | geal diphtheria | 448 |
| born) | | Laryngoscopy in carcinoma of larynx .. | 275 |
| Juvenile infections, diathesis in .. | 252 | Larynx, carcinoma of | 274 |
| — — — rheumatism | 253 | Larynx, diseases of | 275 |
| — — — tuberculosis | 253 | — — — functional aphonia | 275 |
| | | — — — papilloma of | 274 |
| | | — — — tuberculosis of | 275 |
| | | Lavage, alkaline, in secondary esophagitis .. | 359 |
| KALIN'S flocculation test for syphilis .. | 453 | — — — bronchoscopic, in abscess of lung .. | 288 |
| Kala-azar | 254 | Lead poisoning, nephrosclerosis and .. | 404 |
| Knolin in ulcerative colitis | 104 | — — — parathormone in | 384 |
| Knopk and cotton-seed sensitization of skin | | Lecithin phosphorus, relation to remission | |
| Kataphylaxis in filariasis | 189 | of pernicious anemia | 26 |
| Keratitis exfoliativa | 119 | Legal decisions, recent | 276 |
| — sicca | 120 | — — — dangerous drugs register .. | 276 |
| Keratocorns | 121 | — — — diphtheria attributed to post- | |
| Keratomalacia | 120 | scarlatinal otorrhoea | 276 |
| Kidney (<i>see also</i> Hydronephrosis; Nephritis; | | — — — signing of certificates | 276 |
| Renal) | | Legg-Valley disease due to gonococcal arthritis .. | 223 |
| — — — abscess of, cortical | 264 | Leishmaniasis | 254 |
| — — — paramphric | 612 | — — — dermal | 255 |
| — — — perinephric | 263 | Leprosy | 277 |
| — — — actinomycosis of (<i>see</i> Actinomycosis, Renal) | | — — — dermal leishmaniasis and | 255 |
| Kidney, calcification of | 256 | Leptous ulcers, iodoforn in | 278 |
| — — — cancer of | 266 | Leptospiæra icterohæmorrhagicæ and infective | |
| — — — congenital deformities of | 259 | jaundice | 252 |
| — — — floating | 259 | Leucocytosis in chronic malaria patients .. | 305 |
| — — — function in morphine addicts | 14 | — — — and leucopenia due to dental sepsis .. | 131 |
| — — — infantile | 260 | Leukæmia | 278 |
| — — — plastic operations for | 261, 262 | — — — acute, diagnosis of type | 279 |
| — — — secretion, effect of morphin and ether .. | 35 | — — — myelocytic, following trauma | 280 |
| — — — solitary cysts of | 267 | — — — myelogenous, complicated by priapism .. | 280 |
| — — — — operations on | 269 | — — — supravital staining of large mononuclears .. | 279 |
| — — — staphylococcal infections | 265 | Lice as carriers of typhus fever | 495 |
| — — — supernumerary, hydronephrosis and .. | 269 | Lichen scrofulosorum, menes and | 308 |
| Kidney, surgical affections of | 257 | — — — skin disease, blood sugar and .. | 427 |
| — — — — — essential hæmaturia | 262 | Ligature holder with wrist attachment (<i>Fig.</i> | |
| — — — — — hæmihyphrectomy in | 261 | 32) | 540 |
| — — — — — hydronephrosis | 261 | Light therapy | 535 |
| — — — — — intravenous urography in | 257 | — — — in coeliacoid granuloma | 430 |
| — — — — — nephropostosis | 260 | — — — tuberculosis of bones and joints .. | 487 |
| — — — — — ureteropyelonephrostomy in | 262 | Lindau's disease | 280 |
| — — — — — urinary lithiasis | 265 | — — — anglomatus cyst over mid-brain | |
| — — — tuberculosis of | 265 | (<i>Fig.</i> 39) | 281 |
| — — — — — pyelographic diagnosis | 265 | — — — association with tumours elsewhere .. | 282 |
| — — — — — spontaneous cure | 256 | — — — cerebellar cyst in | 282 |
| — — — tumour associated with Lindau's disease | | — — — familial incidence | 283 |
| (<i>Fig.</i> 40) | 282 | — — — pathogenesis | 283 |
| Kirschner's method of wire traction for | | — — — renal tumour associated with (<i>Fig.</i> 40) .. | 282 |
| fractures (<i>Figs.</i> 16, 17) | 191 | — — — retinal angiomatosis and | 282 |
| Kline's slide precipitation tests for syphilis .. | 455 | — — — trauma in etiology | 283 |
| Knee-joint, loose bodies in | 268 | Lip, cancer of | 283 |
| — — — tuberculosis of | 487 | Lipiodol in diagnosis of bronchiectasis .. | 84 |
| — — — knock-knee, renal rickets and | 409 | — — — X-ray examination of gall-bladder .. | 518 |
| Koch's old tuberculin in tuberculous pros- | | Lipodystrophy | 284 |
| tatic | 386 | Lipoid nephrosis | 407 |
| Koch-Weeks bacillus in epidemic conjuncti- | | — — — treatment in surgical tuberculosis .. | 485 |
| vidis | 108 | Liver (<i>see also</i> Hepatic) | |
| Kondoleon's operation for elephantiasis .. | 168 | — — — anelastic abscess of | 17, 286 |
| Kramora in inguinal hernia | 238 | — — — cancer of, secondary | 286 |
| Krysolan in lupus erythematosus | 300 | — — — cirrhosis of | 286 |
| Kurchi bark in anabolic dysentery | 17 | Liver, diseases of | 284 |
| — — — bismuthous iodide in anabolic dysentery | | — — — — — bromsulphalein test for | 286 |

| | PAGE | | PAGE |
|--|------------|--|----------|
| Liver, diseases of, gall-bladder infection and | 284 | Lung, tuberculosis of (<i>see</i> Tuberculosis, Pulmonary) | |
| — — hepatitis due to cinchophen compounds | 284 | Lungs and dyspepsia | 159 |
| Liver efficiency tests | 285 | — oedema of, X-ray diagnosis | 515 |
| Liver extract, 'Dydo' hepol, a new | 525 | Lupoeal in treatment of lupus vulgaris | 301 |
| — extracts in the treatment of sprue | 447, 448 | Lupus erythematosus | 300 |
| — glycogenetic function, glucose-tolerance test and | 285 | Lupus vulgaris | 300 |
| Liver, surgery of | 286 | — — measles and | 308 |
| — syphilis of | 457 | Lymph-glands first area involved in breast cancer | 81 |
| — treatment in acholuric jaundice of infants and children | 18 | — of neck, enlargement of, in endothelioma of nasopharynx | 327 |
| — — anaemia of alimentary origin | 29 | Lymph-nodes, calcified, in the mesentery | 302 |
| Liver treatment in anaemia of infants and children | 18 | Lymph-vessels, surgery of | 69 |
| — — — kala-azar | 266 | Lymphadenitis, mesenteric | 301 |
| — — — undernutrition | 28 | Lymphadenomata, X-ray examination | 296 |
| — — — coecidiodial granuloma | 490 | Lymphoblastoma, classification of types of lymphoma and | 302 |
| — — — haemolytic anaemia | 18 | Lymphogranulomatosis inguinalis, diagnosis | 302 |
| — — — haemophilia | 226 | Lymphoma | 302 |
| — — — pernicious anaemia | 20, 22 | — — Hodgkin's disease and blood-picture | 305 |
| — — — — abortive relapses with | 23 | — lymphoblastoma in classification of | 302 |
| — — — — eosinophilia and | 23 | | |
| — — — — failure of | 24 | MADUROMYCOSIS due to <i>Aspergillus nidulans</i> | 431 |
| — — — — of infants and children | 18 | Magnesium hyposulphite, a new preparation of | 525 |
| — — — — influence on mortality | 22 | — — sulphate, etc., in ankylostomiasis | 43 |
| — — — — insulin as an auxiliary | 24 | — — beri-beri | 62 |
| — — — — of pregnancy | 25, 26 | — — use after spinal analgesia | 31, 33 |
| — — — — reticulo-tytosis and | 23 | Malaria | 303 |
| — — — — use of aqueous extract | 23 | — — clinical | 305 |
| — — — potential pernicious anaemia | 27 | — — etiology | 303 |
| — — — secondary anaemia | 27, 29, 30 | — — prophylaxis | 303 |
| Lobectomy in abscess of lung | 289 | — — treatment | 305 |
| Logan clamp for hare-lip operations (<i>Figs. 33, 34</i>) | 228 | Malarial nephritis | 305 |
| Lozenges, acidulous, in post-operative salivary-gland infections | 380 | Malnutrition as a cause of rheumatism and arthritis | 418 |
| Lugol's solution for angina pectoris in hyperthyroidism | 42 | Mammary (<i>see</i> Breast) | |
| Lumbago | 414 | Mandible (<i>see</i> Jaw) | 339 |
| Lumbar puncture, abscess of brain and | 166 | Manganese chloride in dementia praecox | 316 |
| — — — etiology of post-puncture headache | 89 | — — in diet, dental caries and | 128 |
| — — — in head injuries | 323 | Maula (<i>see</i> Mental Diseases) | |
| — — — labyrinthine affections | 166 | Manic-depressive type of mental depression | 312 |
| — — — meningo-encephalitis complicating mumps | 324 | Marble bones, X-ray diagnosis | 512 |
| Lung (<i>see also</i> Pulmonary) | | Mastication, alveolar bone and | 130 |
| Lung, abscess of | 287 | Mastitis, cystic, diagnosis by transillumination | 242 |
| — — bacteriology | 287 | Mastoid operations, technique of | 164 |
| — — bronchial fistula and | 289 | — — wound retractor (<i>Fig. 94</i>) | 540 |
| — — bronchiectasis and | 289 | Mastoiditis, acute, anomalous types of | 163 |
| — — etiology | 287 | Maternal mortality in relation to contraception and abortion | 371 |
| — — following tonsil operations | 471 | Maternity homes | 581 |
| — — treatment | 287 | Maxilla (<i>see</i> Jaw) | |
| — — — surgical | 289 | Maxillary antrum, infection of, from dental sepsis | 131 |
| Lung, apurid necrosis of | 290 | Mayflies as cause of asthma | 59 |
| — — carcinoma of (<i>Fig. 42</i>) | 293 | Measles | 307 |
| — — complications, post-operative | 378 | — — epidemiology | 307 |
| — — infection as source of tuberculosis of brain | 475 | — — prophylaxis | 308 |
| Lung, massive collapse of | 291 | — — symptoms and complications | 307 |
| — — — classification | 291 | Mediastinitis, X-ray diagnosis | 516 |
| — — — post-operative | 379 | Mediastinum, cysts of, in infants | 299 |
| — — — diagnosis | 379 | — — tumours of (<i>see</i> Lung and Mediastinum, Tumours of) | |
| — — — difference between collapse in pneumothorax and | 379 | Medical Council, General | 586 |
| — — — — mechanism of production | 379 | — — institutions | 566 |
| — — — — pneumonia and | 291 | — — and scientific periodicals | 589 |
| — — — — treatment | 380 | — — societies | 588 |
| — — — — treatment | 292 | Medical and surgical appliances | |
| — — — — X-ray examination | 292, 515 | — — — (Figs. 55-143) | 530 |
| Lung and mediastinum, tumours of | 293 | — — — trades directory | 592 |
| — — — classification | 294 | Medico-legal questions (<i>see</i> Legal Decisions, Recent) | |
| — — — diagnosis | 295 | Meinicke's Klärungsreaktion for syphilis | 455 |
| — — — symptoms | 294 | Melancholia, influenza to ameliorate | 246, 319 |
| — — — treatment | 297 | Melassez, pityrosporon of, in seborrhoeic dermatitis | 429 |
| — — shadows, X-ray localization of | 516 | | |
| — — therapeutic outfit (<i>Fig. 93</i>) | 540 | | |

| | PAGE | | PAGE |
|--|----------|---|----------|
| Membranous gastritis complicating typhoid fever | 492 | Metaphen, skin sterilization and | 374 |
| Ménière's syndrome | 166 | Metatarsal, first, necrosis in epiphysis of | 511 |
| Meningitis (<i>see also</i> Cerebrospinal Fever) | | Methoxymethyl ester of salicylic acid in skin sensitization | 433 |
| — acute, with typhoid fever in infants | 492 | Methyl chloride poisoning | 123 |
| — Wassermann reaction and | 91 | Methylated ether in burns | 86 |
| Meningocele, appropriate time for, and technique of, operation | 459 | — spirits in burns | 86 |
| — classification and pathology (<i>Fig. 52</i>) | 457 | Mickulicz's operation for diverticulitis | 106 |
| Meningo-encephalitis complicating mumps | 324 | Micrococcus catarrhalis in pneumonia | 367 |
| — rubella | 420 | Migraine, influenza in amelioration of | 319 |
| Meningo-mylitis complicating rubella | 420 | Miliary carcinoma, X-ray examination | 297 |
| Menopausal hemorrhage, radium treatment | 395 | Milk in diet, dental caries and | 128 |
| — headaches, thyroid extract in | 469 | — irradiated, in rickets | 419 |
| — symptoms, aminofluin and | 344 | — soured, in ulcerative colitis | 104 |
| — oestrin in | 344 | — unpasteurized, undulant fever and | 496 |
| Menstrual colic, contraception and | 571 | Mirror for nose, throat, and ear surgery (<i>Fig. 95</i>) | 541 |
| Mental analysis in alcoholism | 11 | Mitral stenosis | 324 |
| — changes in pernicious anemia | 25 | — — subacute infective endocarditis and | 175 |
| Mental deficiency | 308 | — — treatment | 324 |
| — Act, 1913, institutions certified under | 573 | — — X-ray diagnosis | 35 |
| — — aesthetics and | 511 | Monesia in inguinal hernia | 263 |
| — — criminal lunatics and arson | 511 | Mongolian idioy, manner of inheritance | 312 |
| — — eugenic sterilization in | 185 | Monilia in etiology of pericelvic | 431 |
| — — Mongolian idioy | 512 | — — sprue | 429 |
| — — in school-children | 308 | — thrush infections of skin | 429 |
| Mental depression, types of | 312 | Monochloroacetic acid treatment of warts | 238 |
| — disease, chronic, associated with ovarian dysfunction | 317 | Monocytosis in chronic malaria patients | 305 |
| — — vesiculectomy for alleviation of | 426 | Monoidocinchopen in rheumatism and arthritis | 418 |
| Mental diseases | 314 | Mononucleosis in diagnosis of poliomyelitis | 370 |
| — — amelioration by influenza | 246, 318 | Morax-Axenfeld bacillus in epidemic conjunctivitis | 108 |
| — — examination of blood and gastric contents in | 25 | Morbili (<i>see</i> Measles) | |
| — — focal sepsis in | 314 | Morbus coxae senilis | 414 |
| — — influenza | 315 | — — — due to gonococcal arthritis | 223 |
| — — intestinal toxæmia | 315 | Morestin's fluid in treatment of hydrocele | 464 |
| — — oral sepsis | 315 | Morison's paste for wound dressings | 147 |
| — — pelvic disease | 317 | Morphia addiction | 13 |
| — — sphenoidal sinusitis | 314 | — — effect on kidney secretion | 14, 35 |
| — — treatment | 316 | — — in enterospasm | 247 |
| — — instability in diagnosis of head injuries | 323 | — — ileus | 246 |
| — — institutions and homes | 566 | — — shock from burns | 86 |
| Mental and nervous sequelæ of trauma | 320 | — — ulcerative colitis | 104 |
| — — — characteristic types | 320 | Mosquitoes, malaria and | 188 |
| — — — confusional syndrome, prognosis of | 320 | — — influence of humidity on infectivity and life of | 304 |
| — — — neurones, prognosis and insurance compensation | 320 | — — transmission of yellow fever by | 523 |
| — — — and interest in vocation | 321 | — — traps for | 305 |
| Merbaphen, action upon the heart | 230 | Motor-car emergency case (<i>Fig. 96</i>) | 541 |
| — in ascites | 408 | Mouth (<i>see also</i> Oral) | |
| — myocardial insufficiency | 408 | — — cancer, dental treatment in | 139 |
| — nephrosis | 408 | — — radium in | 138, 396 |
| Meropurochrome in gonococcal arthritis | 223 | Mouth gag (<i>Fig. 97</i>) | 541 |
| — ointment in chancreoid | 93 | — — for edentulous children (<i>Fig. 98</i>) | 542 |
| — after prostatectomy | 387 | Mouth-opener and airway in anaesthesia (<i>Fig. 99</i>) | 542 |
| — sterilization of skin and | 374 | Mucous gastritis, chronic, in children | 44 |
| — in tonsillitis | 224 | Mucus catheter, an improved (<i>Fig. 100</i>) | 542 |
| Mercuraphen after prostatectomy | 387 | Müller's 'Ballingsreaktion' for syphilis | 453, 455 |
| Mercury acid nitrate and bismuth in lupus erythematosus | 300 | Mummies, bone-growths in, X-ray diagnosis | 513 |
| — cyanide in gonococcal epididymitis | 224 | Mumps | 324 |
| — — discoloration of skin due to | 426 | Murphy drip apparatus in post-operative treatment of diabetes | 148 |
| — in epidemic conjunctivitis | 108 | Muteness due to intracranial birth injuries | 272 |
| — ointment, ammoniated, in favus | 429 | Myalgia | 414 |
| — oxy-cyanide in corneal grafting | 115 | Myelitis due to vaccination | 503 |
| — yellow oxide of, in corneal grafts | 116 | Myelocle, classification | 437 |
| Merycism | 420 | — pathology | 438 |
| Mescaline intoxication, sensations produced by | 12 | Myeloma of tendon and tendon-sheath | 463 |
| Mesenteric lymphadenitis | 301 | Myelomatosis, X-ray diagnosis | 513 |
| Mesenteric, calcified lymph-nodes in | 302 | Myelo-meningocele, classification | 440 |
| Mesotan, skin sensitization and | 433 | — operative technique | 448 |
| Metabolism, diencephalo-pituitary control of | 360, 362 | — pathology | 448 |
| — faulty, in rheumatism and arthritis | 415, 418 | Myocardial insufficiency, treatment | 281 |
| Metaphen in gonococcal arthritis, failure of | 223 | Myocarditis, syphilitic | 281 |

| | PAGE | | PAGE |
|--|----------|--|---------|
| NAEVUS | 324 | Neuritis, retrobulbar, due to vaccination .. | 503 |
| — cutillary, of a renal papilla .. | 262 | Neuroses, examination of blood and gastric contents in .. | 25 |
| Nail brush, boilable (<i>Fig. 101</i>) .. | 512 | Neurosomatic deterioration in epileptics .. | 177 |
| Nails, infection of, in foot ringworm .. | 428 | Neurosyphilis (<i>see also</i> <i>Tabes Dorsalis</i>) .. | |
| Nails, split (<i>Fig. 15</i>) | 189 | — fever treatment of .. | 460 |
| Narcoticy as a complication of epidemic encephalitis .. | 172 | — sulphur injections in G.P.I. .. | 124 |
| Nasal (<i>see also</i> <i>Nose</i>) | | Neurotization in treatment of facial paralysis .. | 186 |
| — catarrh, mental diseases and .. | 314 | New-born (<i>see also</i> <i>Infants</i>) | |
| — swimming baths and .. | 452 | New-born, hæmoglobinuria in .. | 330 |
| — septum, complications of operation on .. | 332 | — Schick test for diphtheria in .. | 153 |
| — operation .. | 332 | Nipple, hæmorrhage from, in breast tumours .. | 80 |
| — perforation in chromium workers .. | 332 | Nipple, Paget's disease of .. | 331 |
| Nasal sinuses, diseases of .. | 325 | Nirvanol treatment of chorea .. | 98 |
| — — radium treatment .. | 325 | Nitrogen in blood, skin diseases and .. | 427 |
| — X-ray examination .. | 326, 520 | — peroxide in atmosphere of X-ray rooms .. | 510 |
| — sinusitis, bronchiectasis and .. | 325 | Nitrohydrochloric acid in hay fever .. | 60 |
| — in children .. | 325 | Nitrous oxide anaesthesia, electrocardiographic study of heart during and after .. | 36 |
| — spray, zephal as a .. | 529 | — — in labour .. | 36 |
| — surgery in treatment of asthma .. | 334 | — — and oxygen for thoracic operations .. | 31 |
| Nasopharynx, endothelioma of .. | 326 | <i>Nose</i> (<i>see also</i> <i>Nasal</i>) | |
| — infection of, from dental sepsis .. | 131 | — deformities of, treatment .. | 331 |
| — swimming baths and .. | 452 | Nose, diseases of | 331 |
| — stenosis of .. | 334 | — — asthma and .. | 334 |
| Nausea treatment, substitute for .. | 353 | — — epistaxis .. | 331 |
| Neck, cystic hygromas of, thyrothymic lymph system and .. | 467 | — — hypertrophic rhinitis .. | 333 |
| Neck, cystic tumours in .. | 328 | — — rhinosporidiosis .. | 335 |
| — endothelioma of .. | 328 | — — turbinal hypertrophy .. | 333 |
| — gland enlargement in, in diagnosis of endothelioma of nasopharynx .. | 327 | — — vasomotor rhinitis .. | 333 |
| Neoarsphenamine in blackwater fever .. | 63 | — polyp of .. | 333 |
| Neocaine in spinal analgesia .. | 31 | <i>Note-book</i> | 595-603 |
| 'Neo-infundin' for obstetrical use .. | 527 | Novasurol in nephrosis .. | 408 |
| Neosalvarsan in otitis media .. | 162 | Novocain and adrenalin in creeping local anaesthesia .. | 9 |
| — in syphilis .. | 458 | — in foot pain .. | 193 |
| — yaws .. | 523 | — mastoid operations .. | 164 |
| Neostibosan treatment of kala-azar .. | 256 | — pain due to intrathoracic tumours .. | 298 |
| Neotrolin, a new urinary antiseptic .. | 527 | — spinal analgesia .. | 30 |
| Nephrectomy in carcinoma of kidney .. | 267 | Nucleus pulposus, X-ray diagnosis and .. | 513 |
| — cortical abscess of kidney .. | 264 | Nursing homes, inspection and registration of .. | 335 |
| — hydronephrosis and .. | 261 | — institutions .. | 581 |
| — partial, of a solitary kidney .. | 269 | Nux vomica in alcoholism .. | 11 |
| — in renal actinomycosis .. | 265 | | |
| — staphylococcal disease of kidney .. | 264 | | |
| Nephritis, chronic, anemia in .. | 406 | | |
| — diet in .. | 406 | | |
| — incidence among young people in Queensland .. | 404 | | |
| — glomerular, pathogenesis .. | 403 | | |
| — malarial .. | 395 | | |
| — treatment .. | 408 | | |
| Nephroexy in nephropotosis .. | 260 | | |
| Nephrosclerosis, plumbism and incidence of as a type of nephritis .. | 404 | | |
| Nephrosis .. | 406 | | |
| — lipid .. | 407 | | |
| — thyroid extract in .. | 348, 469 | | |
| — treatment .. | 408 | | |
| — thyroxin .. | 407 | | |
| Nerve-blocking for pain due to intrathoracic tumours .. | 298 | | |
| Nervous changes in pernicious anemia .. | 25 | | |
| — complications, whooping-cough and .. | 569 | | |
| — sequelæ of trauma (<i>see</i> <i>Mental and Nervous Sequelæ</i>) .. | | | |
| — — vaccination .. | 502, 503 | | |
| — system, angina pectoris and .. | 40 | | |
| — dyspepsia and .. | 159 | | |
| — trichine in .. | 474 | | |
| Nervous system, tuberculosis of .. | 475 | | |
| Neuralgia, trigeminal .. | 329 | | |
| — — complications of ganglion injection treatment .. | 330 | | |
| — — endothelioma of nasopharynx and .. | 326 | | |
| — treatment .. | 329, 330 | | |
| Neuraxitis, epidemic (<i>see</i> <i>Encephalitis</i>) .. | | | |
| Neurectomy, multiple intercostal, in pulmonary tuberculosis .. | 482 | | |
| Neuritis, brachial .. | 414 | | |
| Neuritis, retrobulbar, due to vaccination .. | 503 | | |
| Neuroses, examination of blood and gastric contents in .. | 25 | | |
| Neurosomatic deterioration in epileptics .. | 177 | | |
| Neurosyphilis (<i>see also</i> <i>Tabes Dorsalis</i>) .. | | | |
| — fever treatment of .. | 460 | | |
| — sulphur injections in G.P.I. .. | 124 | | |
| Neurotization in treatment of facial paralysis .. | 186 | | |
| New-born (<i>see also</i> <i>Infants</i>) | | | |
| New-born, hæmoglobinuria in .. | 330 | | |
| — Schick test for diphtheria in .. | 153 | | |
| Nipple, hæmorrhage from, in breast tumours .. | 80 | | |
| Nipple, Paget's disease of .. | 331 | | |
| Nirvanol treatment of chorea .. | 98 | | |
| Nitrogen in blood, skin diseases and .. | 427 | | |
| — peroxide in atmosphere of X-ray rooms .. | 510 | | |
| Nitrohydrochloric acid in hay fever .. | 60 | | |
| Nitrous oxide anaesthesia, electrocardiographic study of heart during and after .. | 36 | | |
| — — in labour .. | 36 | | |
| — — and oxygen for thoracic operations .. | 31 | | |
| <i>Nose</i> (<i>see also</i> <i>Nasal</i>) | | | |
| — deformities of, treatment .. | 331 | | |
| Nose, diseases of | 331 | | |
| — — asthma and .. | 334 | | |
| — — epistaxis .. | 331 | | |
| — — hypertrophic rhinitis .. | 333 | | |
| — — rhinosporidiosis .. | 335 | | |
| — — turbinal hypertrophy .. | 333 | | |
| — — vasomotor rhinitis .. | 333 | | |
| — polyp of .. | 333 | | |
| <i>Note-book</i> | 595-603 | | |
| Novasurol in nephrosis .. | 408 | | |
| Novocain and adrenalin in creeping local anaesthesia .. | 9 | | |
| — in foot pain .. | 193 | | |
| — mastoid operations .. | 164 | | |
| — pain due to intrathoracic tumours .. | 298 | | |
| — spinal analgesia .. | 30 | | |
| Nucleus pulposus, X-ray diagnosis and .. | 513 | | |
| Nursing homes, inspection and registration of .. | 335 | | |
| — institutions .. | 581 | | |
| Nux vomica in alcoholism .. | 11 | | |
| OBESITY , anterior lobe of pituitary and .. | 358 | | |
| — dietary correction .. | 355 | | |
| — pituitary and .. | 359 | | |
| — relationship between insulin production and .. | 149 | | |
| Obstetrics, 'Neo-infundin' for use in .. | 527 | | |
| Occipito-posterior presentations in labour .. | 269 | | |
| Occupational diseases (<i>see</i> <i>Industrial Diseases</i>) .. | | | |
| Ochsner-Sherren (delayed) treatment of appendicitis .. | 47 | | |
| Oculomotor nerve paralysis in diabetes .. | 141 | | |
| Edema complicating erythema infectiosum .. | 182 | | |
| — due to acidosis, alkaline treatment .. | 354 | | |
| Oesophagitis in etiology of cancer of oesophagus .. | 339 | | |
| — pathology .. | 338 | | |
| — treatment .. | 339 | | |
| Oesophagus, carcinoma of .. | 337, 339 | | |
| Oesophagus, diseases of .. | 337 | | |
| — — cardiospasm .. | 337 | | |
| Oesophagus, foreign bodies in .. | 103 | | |
| Oestrin in amenorrhœa .. | 344 | | |
| — distribution of .. | 343 | | |
| — in menopausal symptoms .. | 344 | | |
| Official and trade directory .. | 586 | | |
| Oidium albicans, thrush infections of skin due to .. | 429 | | |
| — coccidioides the cause of coccidioidal granuloma .. | 100 | | |
| Oil of chenopodium in hookworm disease .. | 43 | | |
| — iodized, in bronchiectasis .. | 84 | | |
| Oleoethorax in treatment of pleurisy .. | 366 | | |

| | PAGE | | PAGE |
|---|----------|--|----------|
| Oliguria, parathormone in symptomatic treatment | 348 | Oxygen injection in tuberculous peritonitis .. | 352 |
| Olive oil and gonemal in producing oleothorax | 366 | Oxyquinoline sulphate in diphtheria .. | 155 |
| — in trachoma | 110 | Oxytocic response to pituitrin | 358 |
| Omeisan in chaneroid | 93 | Oxytocin in posterior lobe of pituitary body .. | 358 |
| Oosporaceae, thrush infections of skin due to | 429 | PAGET'S disease of nipple | 331 |
| Opacities of thorax, X-ray diagnosis | 575 | — Pain, anginal, significance of | 42 |
| Open-air treatment in anemias of children .. | 19 | — due to intrathoracic tumours | 298 |
| Operation table, new twin pump (<i>Fig. 102</i>) .. | 542 | Palate, cleft (<i>see</i> Hare-lip and Cleft Palate) | |
| Operations, surgical, heart in relation to | 235 | — soft, mixed tumour of | 355 |
| Opium, cibalgine as a substitute for | 353 | Palsy (<i>see</i> Paralysis) | |
| — in pain due to intrathoracic tumours .. | 298 | Pancreas, cancer of head of | 345 |
| — and starch enema for ulcerative colitis .. | 102, 103 | — — mistaken for sprue | 447 |
| * Opojes* ovarian residue (B.O.G.) in labour .. | 527 | Pancreas, surgery of | 344 |
| Oral cancer, dental treatment in | 139 | Pancreatic tumours, hyperinsulinism and .. | 175 |
| — — radium in | 138, 396 | — — operative treatment | 176 |
| — sepsis, mental diseases and | 315 | Pancreatitis, acute | 344 |
| — — post-operative | 380 | * Panniculitis, mammary | 79 |
| Oral surgery | 339 | Papilla, renal, angioma of | 262 |
| — — dental cysts | 340 | Papillitis | 263 |
| — — fractures of mandible, bone-grafting in | 339 | Papilloma of bladder | 66 |
| Orchidectomy in treatment of cryptorchidism .. | 463 | — larynx | 271 |
| Orchid-epididymitis as a complication of cryptorchidism | 182 | Paradoxical embolism | 168 |
| Orchitis due to mumps | 224 | Paraffin injections in tuberculous joints .. | 489 |
| — — purulent, in gonorrhoea | 222 | — liquid, in diverticulitis | 106 |
| Orli's traction apparatus for fractures (<i>Fig. 18</i>) .. | 527 | — oil in diagnosis of constipation | 112 |
| Oriental sore, orisol in | 527 | — in perforated nasal septum | 333 |
| Orisol, berberine acid sulphate, solution for Oriental sore | 527 | Paraldehyde for premedication in anaesthesia in children | 38 |
| Orthodontia, importance of, in children .. | 135 | Paralysis, cerebral, due to birth injuries .. | 272 |
| Os calcis, deformities of, X-ray diagnosis .. | 511 | — facial, due to Gasserian ganglion injections | 330 |
| Osteitis fibrosa, hyperparathyroidism and .. | 345 | — — treatment | 185 |
| — — and osteomalacia, distinguishing features | 347 | Paralysis, general | 124 |
| — — X-ray diagnosis | 513 | — of oculomotor nerves in diabetes | 141 |
| Osteoarthritis | 414 | — palate, endothelioma of nasopharynx and | 326 |
| Osteoclast, MacLennan's (<i>Fig. 103</i>) | 543 | Paralytic ileus due to ureteral calculus .. | 499 |
| Osteomalacia, hyperparathyroidism and .. | 345 | — — spinal analgesia for | 33 |
| — and osteitis fibrosa, distinguishing features | 347 | — — spinal analgesia for | 32 |
| — in pregnancy, rickets and | 512 | Paraneuritic abscess | 264 |
| Osteomyelitis | 342 | Parapharyngeal abscess | 354 |
| — acute haematogenous, pathological similarity to perinephric abscesses | 263 | Paraplegia of Pott's disease | 484 |
| — after-treatment | 342 | Parathormone treatment in oliguria and .. | 348 |
| — due to staphylococcal infection | 448 | — — amuria | 348 |
| — — wiring of mandibular fractures | 339 | — — of otosclerosis | 342 |
| — treatment | 342 | — — phlebotomy | 348 |
| Osteosynthesis in Pott's disease, types of operation | 484 | — — after removal of parathyroid tumour .. | 346 |
| Osteotomy in club-foot | 192 | — — tetany | 348 |
| Osteo-transversectomy and aspiration in paraplegia of Pott's disease | 484 | Parathyroid glands | 345 |
| Otitis media, chronic suppurative, complications | 163 | — — hyperparathyroidism | 345 |
| — — treatment | 163 | — — hyperparathyroidism | 347 |
| — — in infancy, late results | 162 | — — parathormone therapy | 348 |
| — — as a result of bathing | 161, 452 | — — renal rickets and | 410 |
| Otorrhoea, post-scarlatinal, diphtheria attributed to, legal decision <i>re</i> | 276 | — — hormone, Collip's, hyperadrenia and .. | 346 |
| Otosclerosis | 342 | — — in treatment of vasomotor rhinitis .. | 343 |
| Ovarian abscess, contraception and | 371 | Parathyroidectomy | 345, 348 |
| — dysfunction, mental disease and | 317 | Parathyroid fevers | 348 |
| Ovarian hormones | 342 | — — epinephrinology | 348 |
| — — clinical | 343 | — — symptoms and complications | 348 |
| — — physiology | 343 | Paris green in prophylaxis of malaria .. | 304 |
| — residue (B.O.G.), * Opojes*, in labour .. | 527 | Parakleinsism | 173, 177 |
| — secretion, otosclerosis and | 342 | Paralogue in keratitis sicca | 120 |
| Ovaries, irradiation of, effect upon foetus .. | 374 | Parasol in malaria | 306 |
| Oxyganide of mercury in corneal grafting .. | 116 | Parotid mastoiditis | 163 |
| — — epidemic conjunctivitis | 108 | Parotitis, epidemic | 324 |
| Oxydases, radium treatment and | 398 | Paroxysmal auricular fibrillation, post-operative | 49 |
| Oxygen chamber treatment following thyroidectomy | 468 | — — tachycardia | 51 |
| — — inhaling apparatus, portable (<i>Fig. 104</i>) .. | 543 | 'Parrot disease' | 337 |
| | | Patella, fractures of (<i>Figs. 29-31</i>) | 201 |
| | | Peganum harmala as a source of harmine .. | 173, 174 |
| | | — and harmaline | 349 |
| | | Pellagra | 317 |
| | | Pelvis, disease of, mental diseases and .. | 317 |
| | | — fractures of (<i>Figs. 21, 22</i>) | 197 |
| | | — operations on, embolism and | 378 |
| | | Penis, cancer of | 350 |
| | | — diphtheria of | 152 |

| | PAGE | | PAGE |
|---|----------|---|----------|
| Pepsin in the dressing of ulcers | 495 | Pilocarpine in post-operative retention of urine | 10 |
| Percaine in local anaesthesia | 38, 527 | Pineal body, X-ray examination | 514 |
| — spinal analgesia | 32 | Pink eye | 108 |
| Perchloride of mercury in epidemic conjunctivitis | 108 | Pirquet (von) reaction, tuberculous infection and | 477 |
| Perfume, skin discoloration due to | 427 | Pitkin method of spinal analgesia | 31, 33 |
| Pericardial effusion, electrocardiography in | 51 | 'Pitressin' nasal jelly in diabetes insipidus | 527 |
| Pericarditis, acute, operation for | 233 | Pitressin in posterior lobe of pituitary | 358, 362 |
| — chronic, operation for | 234 | Pituitary disease, psychological features | 361 |
| — types of | 234 | — extract in beri-beri | 62 |
| Pericarditis, tuberculous | 351 | — labour | 271 |
| — X-ray diagnosis | 235 | — functions and diseases summarized | 361, 362 |
| Pericardium, calcification of | 351 | Pituitary gland | 357 |
| — — X-ray examination | 351, 516 | — anterior lobe | 357, 361 |
| — surgery of (<i>see</i> Heart and Pericardium) | | — — diencephalon and | 359, 361 |
| Perineal prostatectomy (<i>see</i> Prostatectomy) | 547 | — — diseases | 361 |
| Perinephric abscess, acute haematogenous | 263 | — — posterior lobe | 358, 362 |
| — due to staphylococcal infection | 448 | — — and sphenoidal sinusitis in mental diseases | 314 |
| Perineuritis due to staphylococcal infection | 448 | Pituitary gland, tumours of | 360, 362 |
| Periodontal tissue, pyorrhea alveolaris and | 130 | — — cyst formation in | 365 |
| Periosteum elevator (<i>Fig.</i> 105) | 543 | — — treatment | 361, 362 |
| Peritonsillar abscess | 354 | — — hormone, ovarian hormone and | 343 |
| Peritonitis in children | 47 | Pituitrin, antidiuretic effects | 358 |
| — — contraception and | 371 | — blood-pressure and | 358 |
| Peritonitis, tuberculous | 352 | — carbohydrate metabolism and | 359 |
| Peritrichiae | 431 | — fat metabolism and | 359, 362 |
| Potassium permanganate of potash in gonorrhoeal proctitis | 221 | — galactagogue effects | 359 |
| Perniciou anaemia (<i>see</i> Anemia, Pernicious) | | — oxytocic response to | 358 |
| Pertussis (<i>see</i> Whooping-cough) | | — pigmentation and | 359, 362 |
| Petrolatum in perforated nasal septum | 333 | — in posterior lobe of pituitary body | 358 |
| Pharmacology and general therapeutics | 352 | Pityriasis folliculorum (demodex) | 363 |
| — — alkalis | 353 | — lichenoides chronica | 364 |
| — — carbon-dioxide foam baths | 353 | Pityriasis lichenoides et varioliformis acuta | 364 |
| — — cibalgine | 353 | Pityrosporon of Malassez, seborrhoeic dermatitis and | 429 |
| — — diet | 353 | Placenta praevia, treatment | 268 |
| — — glucose enema | 352 | Plague | 364 |
| — — phenyl salicylate and calcium chloride | 353 | Plasmochine excretion in urine of malaria patients | 305 |
| Pharmacy and dietetics, progress of | 524 | — in malaria in heroin addicts | 306 |
| Pharyngo-laryngoscope, Burnier's (<i>Fig.</i> 106) | 543 | — prophylaxis of malaria | 304 |
| Pharynx, diseases of | 354 | — treatment of malaria | 305 |
| — — mixed tumour of soft palate | 355 | Plaster casts in gonococcal arthritis | 223 |
| — — parapharyngeal abscess | 354 | Plastic operations for affections of kidney | 261, 262 |
| — — retropharyngeal abscess | 354 | — — ear deformities, technique | 161 |
| — — stenosis of nasopharynx | 354 | — — nasal deformities | 331 |
| Phenolized oil injections for pruritus ani et vulvae | 387 | Platinum chloride in corneal tattooing | 117 |
| Phenyl salicylate in pyuria | 353 | Pleocytosis in diagnosis of poliomyelitis | 370 |
| Phimosis a predisposing cause of carcinoma of penis | 350 | Pleura, endothelioma of, X-ray examination | 296 |
| Phlebitis a contraindication to injections for varicose veins | 504 | Pleural effusion due to intrathoracic growths | 294 |
| — following erythema nodosum | 182 | Pleurisy | 365 |
| — post-operative | 378 | — diaphragmatic, gonococcal infection and | 224 |
| Phosphorus in diet, dental caries and | 128 | — pulmonary tuberculous and | 365 |
| — lecithin, relation to remission of pernicious anaemia | 26 | — and | 402 |
| Phototherapy | 355, 487 | — treatment | 365 |
| — artificial light treatment | 118, 355 | Pleurodynia | 414 |
| — heliotherapy | 355 | Pleurotomy for pyothorax | 483 |
| Phrenic evulsion in abscess of lung | 288, 289 | Plumbism, nephrosclerosis and | 404 |
| — — pleurisy | 366 | — parathormone in | 348 |
| Phrenicotomy in pulmonary tuberculosis | 481 | Pneumectomy, cautery, in bronchiectasis | 84 |
| Phthisis (<i>see</i> Tuberculosis, Pulmonary) | | Pneumobacillus in pneumonia | 367 |
| Physiotherapy in rheumatism and arthritis | 416 | Pneumococcal infection as a source of peritonitis in children | 48 |
| Physostigmine salicylate in corneal grafting | 115 | — pneumonia, a pneumococcal atelectasis | 367 |
| Picric acid in burns near rectum | 86 | Pneumococci in abscess of lung | 287 |
| — — erysipelas | 179 | — epidemic conjunctivitis | 108 |
| Pigmentary changes due to handling radium | 398 | — pneumonia, types of | 367, 368 |
| — effects of pituitrin | 359, 362 | Pneumolysis, extrapleural, in phthisis | 482 |
| Pigmentation from bismuth absorption after use of B.I.P.P. | 356 | Pneumonia | 367 |
| Pilocarpine hydrochloride in test for gonorrhoea | 225 | — diathermy in | 150 |
| — in labyrinthitis | 166 | — in influenza epidemic, symptomless | 367 |
| | | — pneumococcal, a pneumococcal atelectasis | 367 |
| | | — post-operative massive collapse of lung and | 291 |
| | | — treatment | 368 |

| | PAGE | | PAGE |
|--|----------|--|----------|
| Pneumonic infiltrations in measles .. | 307 | Pregnancy and its disorders, perforation of | |
| Pneumonoconiosis, X-ray diagnosis .. | 515 | — uterus by chorion .. | 373 |
| Pneumopericardium, X-ray diagnosis .. | 234, 516 | — epidemic encephalitis and .. | 171, 172 |
| Pneumoperitoneum, perforated gastric ulcer | | — pernicious anaemia of .. | 25 |
| and .. | 214 | — vomiting of .. | 352, 377 |
| Pneumopropicardium, X-ray diagnosis .. | 234, 516 | — Zondek-Aschheim test for .. | 357, 371 |
| Pneumourography in rupture of bladder .. | 64 | Priapism myelogenous leukaemia .. | 280 |
| Pneumothorax apparatus (<i>Fig.</i> 60) .. | 531 | Proctitis, gonorrhoeal .. | 221 |
| — artificial, in lung abscess .. | 288, 289 | Proctoscopy, illuminated, McEvelly's (<i>Fig.</i> | |
| — — pleurisy .. | 366 | 109) .. | 544 |
| — — subclavicular pulmonary tuberculosis | 479 | Pregnancy female sexual hormone .. | 527 |
| — needle, Hef's (<i>Fig.</i> 107) .. | 544 | Prolapse of anus and rectum | |
| — in pulmonary tuberculosis complicating | | (<i>see also</i> Rectum) .. | 46, 400 |
| diabetes .. | 140 | Proliferase, preparation of living yeast cells | 528 |
| Poisoning, cyanide .. | 122 | Prostate, cancer of .. | 382, 385 |
| — food .. | 190, 191 | Prostatic electrode (<i>Fig.</i> 110) .. | 545 |
| — lead, nephrosclerosis and .. | 404 | Prostate, diseases of .. | 381 |
| — — parathormone in .. | 348 | — — complications .. | 382, 384 |
| — methyl chloride .. | 123 | — — obstructive lesions .. | 381, 382 |
| Poliomyelitis .. | 369 | — — prostatectomy and .. | 381, 382 |
| — clinical .. | 369 | — — importance of gradual decompression | |
| — diagnosis .. | 370 | of bladder in .. | 507 |
| — due to vaccination .. | 503 | — fibrous .. | 382 |
| — treatment .. | 370 | — post-operative suppurations, classification | 386 |
| Polya gastrectomy for gastric sarcoma .. | 449 | — tuberculosis of .. | 386 |
| Polyarthritides, sympathetic gangliectomy | | Prostatectomy, after-treatment .. | 386 |
| in .. | 70 | — in carcinoma of bladder .. | 67 |
| Polycystic disease of kidneys .. | 408 | — enlarged prostate and .. | 382 |
| Polycythæmia vera .. | 182 | — operative statistics .. | 384, 385 |
| — X-ray therapy .. | 522 | — technique .. | 384 |
| Polyneuritis, acute influenzal .. | 245 | — perineal, technique and advantages .. | 381 |
| — as a complication of chicken-pox .. | 94 | — bladder drainage and .. | 382 |
| — mumps .. | 324 | — in cancer of prostate .. | 385 |
| — following erythema nodosum .. | 182 | — primary closure of wound .. | 382 |
| Polyposis, multiple, of colon .. | 105 | — retractor for (<i>Fig.</i> 119) .. | 547 |
| Polyuria, anterior lobe of pituitary body and | 358 | — post-operative seminal vesiculitis .. | 387 |
| Postal information .. | 599-600 | — pre-operative treatment .. | 384 |
| Post-mortem examination in renal rickets .. | 410 | — pyelitis and .. | 384 |
| Post-operative retention of urine .. | 10 | — pyelonephritis and .. | 384 |
| — treatment (<i>see</i> Pre- and Post-operative | | — uræmia and urea-concentration test .. | 383 |
| Treatment) .. | | Protein absorption by irradiation, constitu- | |
| Postural treatment in poliomyelitis .. | 370 | tional symptoms and .. | 397 |
| — — post-operative massive collapse of | | — deficiency, pellagra and .. | 350 |
| lung .. | 380 | — restriction in diet for chronic nephritis .. | 406 |
| Potassium antimonyl tartrate in kala-azar | 256 | — therapy in insanity .. | 317 |
| — citrate in oedema due to acidosis .. | 354 | — — rheumatism and arthritis .. | 416 |
| — ferriyanide in argyrosis of conjunctiva | 107 | Proteins in blood of malaria patients .. | 305 |
| — in follicular tonsillomycosis .. | 470 | — dental caries and .. | 127 |
| — iodide in after-treatment of corneal grafts | 116 | — in etiology of asthma .. | 58, 59 |
| — — renal actinomycosis .. | 265 | Proteinuria, Bence-Jones', renal insufficiency | |
| — — coccidioidal granuloma .. | 430 | and .. | 406 |
| — — membranous tonsillomycosis .. | 470 | Pruritus ani et vulvæ .. | 387 |
| — — tonsillo-actino-mycosis .. | 471 | — — — A.B.A. solution in .. | 387, 524 |
| — permanganate in gonorrhoeal proctitis .. | 221 | — — — X-ray therapy .. | 521 |
| Pott's disease .. | 483 | — blood-nitrogen and .. | 427 |
| — — Calot's treatment .. | 484 | — blood-sugar and .. | 427 |
| — — indications for osteo-syntheticizing | | Pseudo-fractures, X-ray diagnosis .. | 512 |
| operation .. | 483 | Psittacosis .. | 387 |
| — — treatment of paraplegia .. | 484 | 'Psoriasisiform and lichenoid eruption' | 364 |
| — — whooping-cough complicating .. | 484 | Psychological accompaniments of pituitary | |
| Practitioners' index .. | 524 | disease .. | 361 |
| Præp. 3510 in trypanosomiasis .. | 474 | Psychoses (<i>see also</i> Mental Diseases) | |
| Pre- and post-operative treatment .. | 374 | — pernicious anaemia and .. | 25 |
| — — blood transfusion reactions .. | 375 | Psychotherapy in alcoholism .. | 10 |
| — — coagulation of blood .. | 375 | — spasmodic torticollis .. | 472 |
| — — post-operative lung complications | | Psychotics, eugenic sterilization of .. | 183 |
| 291, 378 | | Public health, food and the (<i>see</i> Food) | |
| — — — salivary-gland infections .. | 380 | — — swimming baths and the (<i>see</i> Bath- | |
| — — — shock .. | 376 | ing; Swimming Baths) | |
| — — — sterilization of the skin .. | 374 | Puerperium, disorders of .. | 389 |
| — — — venoclysis .. | 377 | — — contraception and .. | 371 |
| Precocity, sexual, cortical tumours of supra- | | — — mortality .. | 389 |
| renals causing .. | 451 | — — scarlet fever .. | 390 |
| Pregnancy Diagnosis Station, Edinburgh, | | — — septicæmia, diathermy in .. | 150 |
| review of year's work .. | 372 | Pulmonary (<i>see also</i> Lung) | |
| Pregnancy and its disorders .. | 371 | — embolism a precursor of paradoxical | |
| — — effect of irradiation of ovaries upon | | embolism .. | 169 |
| fœtus .. | 374 | — — treatment .. | 234 |
| — — maternal mortality in relation to | | — asbestosis (<i>see</i> Asbestosis) | |
| contraception and abortion .. | 371 | — tuberculosis (<i>see</i> Tuberculosis) | |

| | PAGE |
|---|----------|
| Purification of swimming baths | 452 |
| Purin derivatives in nephritis | 458 |
| Purin-base diuretics, action upon the heart | 230a |
| Purpura, chronic recurrent, splenectomy | |
| in | 445 |
| — as a complication of cerebrospinal fever | 88 |
| Pyæmia due to dental sepsis | 151 |
| — paradoxical embolism and | 168 |
| Pyelitis, hæmorrhagic | 263 |
| — nodularis | 263 |
| Pyelography | 257 |
| — intravenous | 257 |
| Pyroplasty for duodenal ulcer, end-results | 213 |
| Pylorus, congenital stenosis of | 391 |
| — — — permanency of tumour | 391 |
| — — — Ramstedt operation, modifica- | |
| tion | 391 |
| — — — spontaneous disappearance . . | 391 |
| — — — types of tumour | 391 |
| Pyrogenic infections | 392 |
| — — — antiviral therapy | 393 |
| — — — septicæmia | 392 |
| — — — of skin (<i>see</i> Skin) | 392 |
| — — — staphylococcal fever | 392 |
| Pyopneumopericardium | 234, 516 |
| Pyorrhœa alveolaris | 129 |
| — — — local vaccine treatment in . . | 393 |
| Pyosalpinx, contraception and | 371 |
| Pyothorax in secondarily infected lungs | 439 |
| Pyothrapy in syphilis | 459 |
| Pyrol in formation of blood | 128 |
| Pyria, phenyl salicylate in treatment of | 352 |

| | |
|---|-----------|
| QUINIDINE in post-operative paroxys- | 49 |
| mal auricular fibrillation | .. |
| — sulphate in paroxysmal tachycardia | 51 |
| Quinine bilydrochloride in vascular navi- | 324 |
| in blackwater fever | .. |
| — hydrochle | 506 |
| — hygroma | 328 |
| injections for prolapse of rectum | 400 |
| — in malaria | 305, 305, |
| varicose veins | 504, 505 |
| — vasomotor rhinitis with hyperthyroidism | 333 |
| Quinisan in influenza, etc. | 528 |
| Quinsy | 324 |

| | | |
|-----------------------------------|---|----------|
| R | ACHISHCHISTS (<i>see</i> <i>Splina Blida</i>) | |
| — | Radiant heat in treatment of ileus | 246 |
| — | Radiography (<i>see</i> X-ray Diagnosis; X-ray Examination) | |
| — | Radiostol in rickets | 420 |
| — | Radiotherapy (<i>see also</i> Radium Treatment; X-ray Therapy) | |
| — | — in cancer of breast | 81 |
| — | — hemorrhage from nipple | 81 |
| — | — malignant tumours of lung and mediastinum | 297, 299 |
| — | — nasal sinusitis | 326 |
| — | — Paget's disease of nipple | 331 |
| — | — rickets | 420 |
| — | — of suprarenals for hypertension | 451 |
| — | — in testicular neoplasms | 465 |
| — | Radium needle forceps (<i>Figs.</i> 76, 77) | 536 |
| — | — — Introducer, Brooke's (<i>Fig.</i> 112) | 545 |
| — | — — Crow's (<i>Fig.</i> 111) | 545 |
| — | — sickness | 397 |
| Radium treatment of cancer | | 396 |
| — | — acute constitutional symptoms | 397 |
| — | — of breast | 83, 396 |
| — | — buccal cavity | 396 |
| — | — calculation of dosage | 396 |
| — | — effect on blood | 398 |
| — | — harmful effects | 397 |
| — | — of larynx | 273 |
| — | — lip | 283 |
| — | — local lesions | 398 |
| — | — œsophagus (<i>Fig.</i> 43) | 337, 338 |

| | |
|--|----------|
| Radium treatment of cancer of penis .. | 350 |
| — — — prostate .. | 385 |
| — — — rectum .. | 396, 399 |
| — — — stimulating effects .. | 397 |
| — — — teletherapy .. | 396 |
| Radium treatment in dentistry .. | 138 |
| — of epistaxis .. | 324 |
| Radium treatment in gynaecology .. | 394 |
| — — — carcinoma of cervix .. | 394 |
| — — — uterine body .. | 395 |
| — — — vagina .. | 394 |
| — — — vulva .. | 394 |
| — — — chorionepithelioma .. | 395 |
| — — — non-malignant conditions .. | 395 |
| — — — of hyperthyroidism .. | 468 |
| — — — malignant disease of the ear .. | 161 |
| — — — nasal sinuses .. | 325 |
| — — — intra-ocular tumours .. | 185 |
| — — — spring catarrh .. | 109 |
| Radon seed introducer with magazine (<i>Fig.</i> 113) .. | 546 |
| Radon seeds in intrathoracic tumours .. | 298 |
| Respirators, rib, new form (<i>Fig.</i> 121) .. | 599 |
| Rat-catching apparatus .. | 364 |
| Rats, immunization against plague .. | 364 |
| Raynaud's disease, acetylcholine in .. | 524 |
| — — — sympathetic ganglionectomy in .. | 70 |
| Record syringe case (<i>Fig.</i> 114) .. | 546 |
| — — — needles, improved pattern (<i>Fig.</i> 115) .. | 546 |
| Rectal electrode, new form (<i>Fig.</i> 116) .. | 547 |
| — — — speculum, Gabriel's (<i>Fig.</i> 117) .. | 547 |
| Recti, divarication of, reefing operation for (<i>Figs.</i> 37, 38) .. | 240 |
| Rectoscope, electric (<i>Fig.</i> 118) .. | 547 |
| Rectum, cancer of .. | 398 |
| — — — method of spread .. | 398 |
| — — — operative treatment .. | 399 |
| — — — radium treatment .. | 396, 399 |
| — — — fistula of, perineal prostatectomy and .. | 382 |
| — — — implantation of ureters into .. | 63 |
| Rectum, prolapse of .. | 400 |
| — — — in adults, fixation operation .. | 46 |
| — — — children, silver ring insertion .. | 46 |
| — — — treatment .. | 400 |
| Rectum and sigmoid, stercoliths of .. | 400 |
| Rectus abdominis, spontaneous hematoma of .. | 225 |
| Re-education treatment of chronic deafness .. | 124 |
| Refrigerators, electric, methyl chloride poisoning from .. | 323 |
| Registration and inspection of nursing homes .. | 125 |
| Renal (see also Kidney) .. | 513 |
| — — — calculus, X-ray examination during opera- tion .. | 518 |
| Renal disease .. | 403 |
| — — — acute glomerulonephritis .. | 404 |
| — — — 'cardiovascular', blood-count in .. | 405 |
| — — — chronic nephritis among young people .. | 404 |
| — — — in Queensland .. | 404 |
| — — — familial polycystic disease .. | 408 |
| — — — glomerular nephritis .. | 405, 408 |
| — — — nephrosis .. | 406, 408 |
| — — — renal insufficiency with Bence-Jones' .. | 406 |
| — — — — — proteinuria .. | 406 |
| — — — — — indican determination of blood .. | 405 |
| — — — selection of diuretics .. | 407, 409 |
| — — — uramia, diazo-colour reaction in .. | 404 |
| — — — function in hyperparathyroidism .. | 346, 347 |
| — — — infantism .. | 409 |
| Renal rickets .. | 409 |
| — — — characteristics .. | 409 |
| — — — clinical .. | 409 |
| — — — differential diagnosis .. | 411 |
| — — — post-mortem appearances .. | 410 |
| — — — treatment .. | 411 |
| — — — X-ray examination .. | 409 |
| Respiratory affections, Seggy capsules for .. | 525 |
| — — — infections, swimming baths and .. | 451 |
| — — — mechanism, abdominal operations and .. | 371 |

| | PAGE | | PAGE |
|--|---------------|---|----------|
| Respiratory tract, upper, disease of, X-ray diagnosis | 517 | Saline, normal, for intraperitoneal therapy | 95 |
| Retention of urine, post-operative | 10 | — — in venoclysis | 377 |
| Reticulocytes, response to various treatments for secondary anemia | 29 | Salines in bacillary dysentery | 159 |
| Reticulocytosis in hemolytic jaundice, splenectomy and | 251 | Salivode (Gabbal) in rheumatism and sciatica | 528 |
| — and liver treatment of pernicious anemia | 23 | Salivary gland infections, post-operative | 380 |
| Retinal angiomatosis, Lindau's disease and | 282 | — stasis, post-operative | 380 |
| — arteriosclerosis in diagnosis of certain diseases | 72 | Salpingo-oophorectomy in ovarian dysfunction associated with mental disease | 517 |
| Retinal detachment | 411 | Salvarsan in pre-operative treatment of | |
| Retractor for bone-plating operation (<i>Fig.</i> 120) | 548 | — Egyptian splenomegaly | 446 |
| — perineal prostatectomy (<i>Fig.</i> 119) | 547 | — syphilis | 458 |
| Retropharyngeal abscess | 354 | Salyrgan in myocardial insufficiency | 408 |
| Retrosternal goitres, operative technique | 220 | Sanatoria for tuberculosis | 577 |
| Rheumatic diathesis in children | 253 | Sanocrysin in lupus erythematosus | 300 |
| — diseases, chronic, vaccine treatment of | 529 | — pulmonary tuberculosis | 479 |
| Rheumatism and arthritis | 414 | Saphenous vein, ligation of, in varicose veins | 504 |
| — — classification | 414 | Sarcoma of bladder | 65 |
| — — diagnosis | 416 | — intra-ocular, radium treatment | 185 |
| — — etiology | 415, 417 | — of stomach | 449 |
| — — incidence | 414, 415, 416 | Scalp, foreign bodies in, X-ray examination | 520 |
| — — tissue reaction in | 417 | — ringworm of, thallium treatment | 429 |
| — — treatment | 415, 418 | Scarlet fever | 421 |
| — due to dental sepsis | 131 | — — Dick test | 421 |
| — — electrocardiography in | 51 | — — effect of absence of tonsils on incidence | 472 |
| — — erythema elevatum diutinum and | 181 | — — epidemiology | 421 |
| — — salivode (Gabbal) in | 528 | — — etiology | 421 |
| rheumatoid arthritis | 414 | — — immunity to erysipelas and | 421 |
| Rhinitis, hypertrophic, treatment | 333 | — — immunization against | 423 |
| — vasomotor, drug treatment | 333 | Scarlet fever, management of | 424 |
| Rhinological method of operation on dental cysts | 340 | — — prophylaxis | 422 |
| Rhinorrhea, spasmodic | 333 | — — puerperal | 390 |
| Rhinopneurosclerosis | 335 | — — symptoms and complications | 422 |
| Rib retractor, new form (<i>Fig.</i> 121) | 548 | — — treatment | 423 |
| — resection in emphysema | 169, 170 | Schick test for diphtheria | 153 |
| — shears, Morrison Davies's (<i>Fig.</i> 122) | 548 | Schistosomiasis | 435 |
| — Tudor Edwards's (<i>Fig.</i> 123) | 548 | Schizophrenia | 135 |
| — stripper, double-ended (<i>Fig.</i> 124) | 548 | — influence in amellation of | 246, 310 |
| Rice, polished, as a cause of beri-beri | 62 | Schizo-saccharomyces, seborrhoeic dermatitis | 430 |
| Rickets | 419 | — and | |
| — hyperparathyroidism and | 345 | Schultz-Charlton reaction | 307 |
| — — round (see Renal Rickets) | | Sciatica | 414 |
| — treatment | 419 | — salivode (Gabbal) in | 528 |
| — X-ray diagnosis | 512 | Scleroderma, sympathetic ganglionectomy in | 70 |
| Ringer's solution in venoclysis | 377 | Sclerosis, disseminated, B.G.G. test in | 92 |
| Ringworm of foot | 428 | — — remission of, following measles and | 307 |
| — scalp, thallium treatment | 429 | Serotonin, diseases of (see Testicle and Scrotum) | |
| Rivanol in anebic dysentery | 16 | Seborrhoeic dermatitis, organisms producing | 429, 430 |
| Rodet's serum in typhoid fever | 495 | Segy capsules for respiratory affections | 525 |
| Roentgen ray (see X-ray) | | Selectan neutral in intravenous urography | 257 |
| Rosenwald's treatment of chancreoid | 93 | Seminal vesicle infection, prostatectomy | 586 |
| Rubella | 420 | — and | |
| Rumination | 420 | Seminal vesicles, surgery of | 426 |
| Rupture of bladder | 64 | Senna pods elixir and lozenges | 528 |
| — — pelvic fractures and | 197 | Sepsis, dental (see Dental Sepsis) | |
| — — bowel from compressed air | 247 | — — focal, heart efficiency and | 233 |
| Rupture of urethra | 500 | — — in the psychoses | 314 |
| — — pelvic fractures and | 197 | — — — elimination of | 316 |
| 'Rush' inoculation for asthma and hay fever | 59 | — — — rheumatism and arthritis due to | 415, 417 |
| | | — — of urinary tract in prostatic diseases | 383 |
| | | Septicæmia, acute, due to dental sepsis | 131 |
| | | — — puerperal, diathermy in | 150 |
| | | — — staphylococcal, complicating pernicious | 448 |
| | | — — — anemia | 392 |
| | | — — treatment | |
| | | Serum, antineurococcic, in cerebrospinal | 88 |
| | | — fever | |
| | | — — anti-scarlet-fever, puerperal streptococcal | 390 |
| | | — — infection and | 240 |
| | | — — blood, in treatment of herpes zoster | 95 |
| | | — — convalescent, use of, in chicken-pox | 220 |
| | | — — diagnosis of gonorrhoea | 423 |
| | | — — in scarlet fever immunization | 452 |
| | | — — tests for syphilis | 454, 456 |
| | | — — — comparison of delicacy | 455 |
| | | — — — technique of new methods | 453 |
| | | — — — uniform method of recording | |

| | PAGE | | PAGE |
|---|----------|---|----------|
| Serum treatment in bacillary dysentery .. | 158 | Sodium bismuth thioglycollate in syphilis .. | 528 |
| — botulism | 191 | — borofornate in chancreoid | 93 |
| — cryspelas | 179 | — cacodylate in blackwater fever | 63 |
| — gas gangrene | 208 | — chloride injections in ileus | 246 |
| — insensitivity | 318 | — — varicose veins | 504, 505 |
| — plague | 364 | — citrate as a blood coagulant | 375 |
| — polymycetis | 370 | — iodide and urea in intravenous urography .. | 258 |
| — post-vaccinal encephalitis | 503 | — morphine in varicose veins | 528 |
| — prophylaxis of measles | 308 | — <i>n</i> -phenylglycineamide-4-stibenate in kala-azar | 256 |
| — scarlet fever | 423 | — salicylate in erythema nodosum | 182 |
| — septicæmia | 392 | — sulphocyanate elixir in hypertension .. | 525 |
| — typhoid fever | 493 | — thiosulphate in argyrosis of conjunctiva .. | 107 |
| — ulcerative colitis | 105 | Soft sore | 92 |
| Serum-antimony test for kala-azar | 254 | Solignum in infective arthritis | 528 |
| Serum-calcium content, hyperparathyroidism and | 345-347 | Solieri treatment of open tuberculosis .. | 485 |
| Sexual hormone, female, progynon | 527 | Soutter's traction apparatus for fractures .. | 196 |
| — precocity, tumours of suprapurals and .. | 451 | Spa treatment of rheumatism and arthritis .. | 417, 419 |
| Shears, rib, Morrison Davies's (<i>Fig. 122</i>) .. | 548 | Spas, British | 582 |
| — Tumor Edwards's (<i>Fig. 123</i>) | 548 | Spasmodic torticollis | 472 |
| Shingles, blood-serum treatment | 240 | Spectra of cerebrospinal fluid shown by .. | 90 |
| — complicating epidemic encephalitis .. | 172 | — ultra-violet light (<i>Fig. 8</i>) | 549 |
| Shock from burns | 86 | Spectrum electric attachment (<i>Fig. 126</i>) .. | 549 |
| — treatment | 376 | — haemorrhoidal, and case (<i>Figs. 128, 129</i>) .. | 547 |
| Sigmoid, stercoliths of | 402 | — rectal, Gabriel's (<i>Fig. 117</i>) | 314 |
| Sigmoiditis, treatment | 107 | Sphincteric plecting for prolapse of rectum .. | 401 |
| Silk, artificial, conjunctivitis due to | 107 | (<i>Figs. 44-48</i>) | 437 |
| Silver nitrate in dressing ulcers | 495 | Spina bifida | 439 |
| — — veruicle | 431 | — — appropriate time for operation | 437 |
| — protein after prostatectomy | 387 | — — classification | 437 |
| — — in gonorrheal proctitis | 221 | — — course of disease | 439 |
| — salts in corneal tattooing | 117 | — — final results of operation | 440 |
| — in treatment of epidemic conjunctivitis .. | 108 | — — incidence | 438 |
| — trachoma | 111 | — — method of demonstrating sac contents .. | 440 |
| Sinusitis, nasal (<i>see also</i> Nasal Sinuses) .. | 114 | — — occulta, classification and pathology .. | 437 |
| — sphenoidal, mental diseases and | 452 | — — in relation to nocturnal enuresis .. | 441 |
| — swimming baths and | 426 | — — operative mortality | 440 |
| Skin, discoloration of | 426 | — — technique | 439 |
| — due to mercury | 426 | — — pathology | 437 |
| — — use of perfume | 427 | — — post-operative progress | 440 |
| Skin diseases, 'Azouli' solution A.B.A. in .. | 524 | — — spontaneous cure | 439 |
| Skin diseases, blood-chemistry of | 427 | Spinal analgesia (<i>see</i> Anesthesia, Spinal) .. | 21 |
| — eruptions following vaccination | 502 | — — cord, degeneration of, gastric defect and .. | 447 |
| Skin, fungous infections of | 428 | — — sprue and | 447 |
| — actinomycosis | 431 | — — puncture, importance of gradual withdrawal of fluid | 507 |
| — blastomycosis | 437 | Spine, caries of (<i>see</i> Pott's Disease) | 443 |
| — coccidioidal granuloma | 100, 430 | — — cervical, dislocation of | 443 |
| — favus | 429 | — — fracture-dislocation of (<i>Fig. 53</i>) .. | 442, 443 |
| — madurocycosis | 431 | — — compression fractures of | 442 |
| — perleche | 430 | — — fracture-dislocation of | 441 |
| — ringworm of feet | 428 | Spine, injuries of | 441 |
| — scalp | 429 | — — classification for purpose of treatment .. | 441 |
| — trichophyrites | 428 | — — diagnosis | 443 |
| — yeast-like infections | 429 | — — intervertebral discs | 444 |
| — gonococcal infection of | 294 | — — nursing of | 443 |
| — infections, swimming baths and | 428, 432 | — — reversible bed-frame for | 444 |
| Skin, pyogenic infections of | 432 | Spinoecaine in paralytic ileus | 32 |
| — — bacteriophage treatment | 432 | — — spinal analgesia | 31 |
| — — syccosis barbae | 432 | Spirogram showing effect of hyperventilation .. | 293 |
| Skin sensitization in dermatitis and eczema .. | 432 | — — on respiration (<i>Fig. 41</i>) | 443 |
| — sterilization of | 374 | Spleen, rupture of | 445 |
| Skin-grafting | 434 | Spleen, surgical affections of | 445 |
| — removal of scars and disfigurements .. | 435 | Splenectomy in acholuric jaundice | 18 |
| — sieve graft (<i>Figs. 50, 51</i>) | 434 | — — indications for | 445 |
| — small whole-thickness grafts | 434 | — — operative technique | 446 |
| — Thiersch grafts, advantages of | 435 | — — and reticulocytosis in hemolytic jaundice .. | 251 |
| — ultra-violet light in preparation of tissue .. | 435 | Splenic anaemia, splenectomy in | 445 |
| Skull plough, Lambert Rogers's (<i>Fig. 125</i>) .. | 549 | — — artery, rupture of aneurysm of | 445 |
| Sledge-dogs in etiology of typhoid in Greenland | 491 | Splenomegaly, Egyptian | 446 |
| Small-pox (<i>see also</i> Vaccination) | 436 | — — Gaucher's, in infancy, diagnosis | 216 |
| — epidemiology | 436 | Spondylitis, parathyroidectomy in | 546 |
| — symptoms and complications | 436 | Sprung catarrh, treatment of | 108 |
| Smegma, decomposition of, relation to cancer .. | 350 | Sprue | 446 |
| Smoking, cancer of tongue and | 457 | — — cancer of pancreas mistaken for | 447 |
| — thrombo-angiitis obliterans due to | 54 | — — etiology | 447 |
| Societies, medical | 588 | — — treatment | 446 |
| Sodium bicarbonate in oedema due to achilosis .. | 354 | | |
| — — superficial burns | 86 | | |

| | PAGE |
|--|----------|
| Stainless steel utensils, 'Staybright' (<i>Fig.</i> 130) .. | 550 |
| Staphylococcal disease of kidney .. | 263 |
| — fever, natural history, prognosis, and treatment .. | 392 |
| Staphylococcal infections .. | 448 |
| — laryngitis simulating laryngeal diphtheria .. | 448 |
| — septicæmia complicating pernicious anaemia .. | 448 |
| Staphylococci in abscess of lung .. | 287 |
| — in epidemic conjunctivitis .. | 108 |
| — gall-bladder infection .. | 285 |
| Staphylococcus aureus in pneumonia .. | 367 |
| Starch and opium enema for ulcerative colitis .. | 102, 103 |
| — uncooked, in diabetes .. | 148 |
| Stegomyia ægypti, dispersion rate .. | 523 |
| Stellar ganglion, excision of, in mitral stenosis .. | 324 |
| Stenosis, mitral, treatment .. | 324 |
| — of nasopharynx .. | 354 |
| — orifice of a gastro-enterostomy .. | 214 |
| — pylorus, congenital (<i>see</i> Pylorus) | |
| Stercoliths of rectum and sigmoid .. | 402 |
| Sterilization, eugenic .. | 183 |
| — of the skin .. | 374 |
| Stethoscope, double-folding (<i>Fig.</i> 131) .. | 550 |
| Stiles's method of implanting ureters into rectum, Grey Turner's modification .. | 63 |
| Still-born children, intrauterine trauma and Stokes-Adams syndrome .. | 272 |
| Stomach (<i>see also</i> Gastric) .. | 50 |
| — cancer of .. | 449 |
| — emptying, delay in, diagnostic value .. | 517 |
| — integrity of, relation to metabolism .. | 20 |
| — preparations in treatment of pernicious anaemia .. | 24 |
| — relation to pernicious anaemia and funicular myelosis .. | 21 |
| — sarcoma of .. | 449 |
| Stomach, surgical diseases of .. | 448 |
| — — — gastroparesis .. | 448 |
| Stovaine in spinal analgesia, danger of Stramonium in epidemic encephalitis .. | 30 |
| — post-encephalitic Parkinsonism .. | 172 |
| — — — post-encephalitic Parkinsonism .. | 174 |
| Strapping in treatment of varicose veins .. | 495 |
| Streptococcal infection causing cardiac thrombosis .. | 40 |
| — — as a source of peritonitis in children .. | 48 |
| — vaccine in septicaemia .. | 392 |
| Streptococci as a cause of elephantiasis .. | 168 |
| — dental sepsis and .. | 131 |
| — in epidemic conjunctivitis .. | 108 |
| — filarial abscess and .. | 189 |
| — in gall-bladder infection .. | 203, 285 |
| — in hæmolytic, in abscess of lung .. | 287 |
| — — — glomerular nephritis and .. | 403 |
| — — — in pneumonia .. | 367 |
| — — — sprue and .. | 447 |
| — ischio-rectal abscess due to .. | 250 |
| — — — prostatic scarlet fever and .. | 390 |
| — in rheumatism and arthritis .. | 417 |
| — scarlet fever .. | 421 |
| Streptococcus faecalis, ischio-rectal abscess due to .. | 250 |
| — — — ignavus, erythema elevatum diutinum and .. | 181 |
| — — — scarlatina, books infected by .. | 244 |
| — — — viridans in abscess of lung .. | 287 |
| — — — pneumonia .. | 367 |
| — — — subacute infective endocarditis and .. | 175 |
| Stripper, rib, double-ended (<i>Fig.</i> 124) .. | 649 |
| Strophanthin, action upon heart .. | 230 |
| — dosage and methods of administration .. | 230 |
| Strophanthus Kombé, a standardized strophanthin .. | 230 |
| Styphnine sulphate in malaria .. | 306 |
| Sublimato solution in erysipelas .. | 180 |
| Subphrenic abscess .. | 450 |
| Suction (<i>see also</i> Aspiration) .. | |
| — treatment of diphtheria .. | 155 |
| — — otitis media .. | 162 |

| | PAGE |
|--|------|
| Sugar in blood (<i>see</i> Blood Sugar) .. | |
| — hypertonic solutions of, in nephritis .. | 408 |
| Suicidal tendency in diagnosis of head injuries .. | 323 |
| Sulfosin in syphilis .. | 459 |
| Sulpharsphenamine in otitis media .. | 162 |
| Sulphate of oxyquinoline in diphtheria .. | 155 |
| — zinc ointment in lupus vulgaris .. | 391 |
| Sulphosin leo in dementia paralytica .. | 124 |
| Sulphur colloidal, in syphilis .. | 460 |
| — injections in dementia paralytica .. | 124 |
| — in sycosis barbae .. | 432 |
| Sulphuric acid injections for prolapsed rectum .. | 400 |
| Sunlight as an aid to calcium assimilation .. | 129 |
| — in phthisis .. | 355 |
| — surgical tuberculosis .. | 487 |
| — undulant fever .. | 497 |
| Suprapubic opening, permanent, new method of making .. | 69 |
| Suprarenal glands .. | 450 |
| — — cortical tumours of .. | 451 |
| — — displacements of .. | 259 |
| — — X-ray examination .. | 520 |
| — tumour of the medulla of, hypertension and .. | 451 |
| Swallowing, mechanism of, X-ray examination .. | 517 |
| Surgical and medical appliances (<i>Figs.</i> 55-143) .. | 530 |
| Suture case, spirit-tight (<i>Fig.</i> 132) .. | 550 |
| — needles, hollow (<i>Fig.</i> 133) .. | 551 |
| Swimming baths (<i>see also</i> Bathing) | |
| Swimming baths and the public health .. | 451 |
| — — — conditions transmitted 160, 428, 451 .. | 452 |
| — — — methods of purification .. | 452 |
| Sycoosis barbae, treatment .. | 432 |
| Synovitis following chicken-pox .. | 94 |
| Syphilis .. | 452 |
| — active, the liver in .. | 457 |
| — bone lesions in, X-ray diagnosis .. | 513 |
| — cancer and .. | 457 |
| — diagnosis .. | 452 |
| — experimental .. | 456 |
| Syphilis of heart .. | 231 |
| — of internal ear .. | 167 |
| — nervous system (<i>see also</i> Dementia Paralytica; Tabes Dorsalis) .. | |
| — — — Takata-Ara test in .. | 91 |
| — — — sodium bismuth thioglycollate in .. | 528 |
| — tests of prophylactic disinfectants .. | 456 |
| — transmission by intercourse between symptomless rabbits .. | 456 |
| — treatment .. | 458 |
| — yaws and cross-immunity .. | 522 |
| Syphilitic appendicitis .. | 47 |
| Syringe adaptors, Taylor's (<i>Fig.</i> 135) .. | 551 |
| — case for Record syringes (<i>Fig.</i> 114) .. | 546 |
| — Moyzhan-Urile (<i>Fig.</i> 134) .. | 551 |
| T.A.B. vaccine inoculation against typhoid fever .. | 493 |
| Tabes dorsalis .. | 460 |
| — — Charcot's arthropathy .. | 461 |
| — — juvenile .. | 461 |
| — — — pathogenesis .. | 460 |
| Tachycardia, paroxysmal .. | 51 |
| — produced by nitrous oxide anaesthesia .. | 36 |
| Tenionylcins africanus, yellow fever and .. | 523 |
| Takata-Ara test for neurological disorders .. | 91 |
| Tannate of cobalt in corneal tattooing .. | 118 |
| Tannic acid in burns .. | 85 |
| — — — chancroid .. | 93 |
| — — — enema for ulcerative colitis .. | 104 |
| — — — gold chloride tattooing of cornea .. | 117 |
| — — — inguinal hernia .. | 238 |
| — — — varicose ulcers .. | 86 |
| Tannin in iron sulphate tattooing of cornea .. | 117 |

| | PAGE | | PAGE |
|---|----------|--|----------|
| Tartar emetic in Egyptian splenomegaly .. | 446 | Thyrotoxicosis, thyrectomy in treatment of .. | 466 |
| — in schistosomiasis .. | 425 | Thyroxine, effect on elimination of avertin .. | 35 |
| Teeth (<i>see</i> Dental) | | — in nephrosis .. | 407 |
| Telangiectasis due to handling of radium .. | 398 | Tic douloureux (<i>see</i> Neuralgia, Trigeminal) | |
| Telotherapy method of radium treatment .. | 396 | Tinnitus, diathermy in .. | 124 |
| Tellurium treatment of syphilis .. | 459 | Tissue forceps, Taylor's (<i>Fig.</i> 78) .. | 536 |
| Tendon and tendon-sheaths, injuries and diseases of .. | 462 | Toast, dietetic value in diabetes .. | 148 |
| Teratoma, operative treatment .. | 298 | Tongue depressor, a new irrigating (<i>Fig.</i> 136) .. | 551 |
| — symptoms .. | 294 | — and gag, Milton's (<i>Figs.</i> 85, 86) .. | 538 |
| — X-ray examination .. | 295 | Tongue, tuberculous ulcers of .. | 469 |
| Testicle (<i>see also</i> Orchitis) | | Tonsil exploring hook (<i>Fig.</i> 137) .. | 551 |
| — dislocation of .. | 464 | — guillotine, La Force's (<i>Fig.</i> 138) .. | 552 |
| — neoplasms of .. | 465 | — hæmorrhage clamp (<i>Fig.</i> 139) .. | 552 |
| Testicle and scrotum, diseases of .. | 463 | Tonsil-holding forceps, Mason's (<i>Fig.</i> 79) .. | 536 |
| — — cryptorchidism .. | 463 | Tonsillectomy in children, Schick test and .. | 153 |
| — — hydrocele .. | 461 | — ethyl chloride with oxygen as anæsthetic .. | 38 |
| — undescended, operative measures .. | 464 | — measurement of extent of aspiration of blood and secretions in .. | 471 |
| Tetany following parathyroid operations .. | 346, 347 | Tonsillitis, swimming baths and .. | 452 |
| Tetrachlorethylene in hookworm disease .. | 43 | Tonsillo-actinomycosis .. | 471 |
| Thallium treatment of ringworm of scalp .. | 429 | Tonsillomycosis, acute follicular .. | 470 |
| Thallosphyte, skin infections due to .. | 429 | — — membranous .. | 470 |
| Thallosporales, skin infections due to .. | 429 | — chronic, types of .. | 470 |
| Theobromine, action upon heart .. | 230 | — fusca .. | 470, 471 |
| Theophylline compound elixir, indications .. | 255 | — spiculata .. | 470, 471 |
| — ethylenediamine, action upon heart .. | 230 | Tonsillo-pseudo-actinomycosis .. | 470, 471 |
| — sodium acetate, action upon heart .. | 230 | Tonsils, asthma in children and .. | 57 |
| Thiocresol as a dressing for ulcers .. | 495 | — bacteriological and clinical relationship .. | 470 |
| Thioglycollamide of antimony in schistosomiasis .. | 425 | Tonsils, diseases of .. | 470 |
| Thiosulphate of sodium in argyrosis of conjunctiva .. | 107 | — — operative complications .. | 471 |
| Thoracoplasty in abscess of lung .. | 288 | — — scarlatinal infection .. | 471 |
| — following dietetic treatment in phthisis .. | 480 | — — tonsillar factor .. | 471 |
| — in phthisis, indications and results .. | 481 | — — tonsillomycosis .. | 470 |
| Thrombo-angiitis obliterans .. | 465 | — infection of, from dental sepsis .. | 131 |
| — — intravenous hypertonic salt solutions in .. | 54 | — nasal sinusitis in children and .. | 325 |
| — — smoking as contributory cause .. | 54 | Torticollis .. | 414 |
| — — sympathectomy ganglionectomy in .. | 70 | Torticollis, spasmodic .. | 472 |
| — — symptoms .. | 465 | Towel-holding forceps, Higgs's (<i>Fig.</i> 80) .. | 537 |
| — — treatment .. | 466 | Toxæmia due to dental sepsis .. | 131 |
| Thromboplastin brain tissue in hæmorrhage .. | 529 | — intestinal, mental diseases and .. | 315 |
| Thrombosis, coronary (<i>see</i> Coronary Thrombosis) | | Toxins in scarlet fever immunization .. | 423 |
| — of iliac artery complicating chicken-pox .. | 94 | Trachea, diseases of .. | 473 |
| — lateral sinus complicating otitis media .. | 164 | — foreign body in .. | 473 |
| — in venous system, paradoxical embolism and .. | 168 | Tracheotomy tube, retained .. | 473 |
| Thrush infections of skin .. | 429 | Trachoma .. | 109 |
| Thymectomy in thyrotoxicosis .. | 466 | Traction frame for fractures of leg (<i>Figs.</i> 140, 141) .. | 553 |
| Thymophysin (Dr. Temesvary) in labour .. | 529 | Trades directory, medical .. | 592 |
| Thyroiditis in carcinoma of larynx .. | 275 | Transcutan baths in rheumatism and arthritis .. | 418 |
| Thyroid abnormality, pellagra and .. | 359 | Transfusion of blood (<i>see</i> Blood Transfusion) | |
| — extract in hepatitis following gall-bladder operations .. | 207 | Transillumination, illumination and .. | 241 |
| — — high blood-pressure .. | 73 | Trauma in etiology of Lindau's disease .. | 283 |
| — — hyperinsulinism associated with pancreatic tumour .. | 176 | — — pyorrhæa alveolaris .. | 129 |
| — — in latent tetany .. | 348 | — — mental and nervous sequelæ of (<i>see</i> Mental and Nervous Sequelæ) | |
| — — menopausal headaches .. | 469 | Trendelenburg position during tonsillectomy .. | 472 |
| — — nephrosis .. | 348, 469 | — — in spinal analgesia, blood-pressure and .. | 31 |
| — — parenchymatous goitre .. | 469 | Treparsol and eucaine in anæsthetic liver abscess .. | 18 |
| — — prophylaxis of embolism and phlebitis .. | 378 | Trichinosis .. | 471 |
| — — thyronal dystrophy .. | 469 | Trichophyrites .. | 428 |
| — — vasomotor rhinitis .. | 333 | Trigeminal neuralgia (<i>see</i> Neuralgia) | |
| Thyroid gland (<i>see also</i> Goitre; Hyperthyroidism) .. | 466 | Trimethylene bromide in anæsthesia .. | 34 |
| — — malignant disease of .. | 469 | Triphal in trachoma .. | 110 |
| — — pharmacology and therapeutics .. | 469 | Trochanter, greater, injuries of, X-ray diagnosis .. | 511 |
| — — tumour of, subternal, symptoms .. | 295 | — — lesser, separation of epiphysis of .. | 511 |
| — — — X-ray examination .. | 296 | Trypanavine in cerebrospinal fever .. | 88 |
| Thyroid-ovarian emblems .. | 526 | Trypanosomes, action of blood-serum on .. | 475 |
| Thyroidectomy in hyperthyroidism .. | 468 | Trypanosomiasis .. | 474 |
| — post-operative paroxysmal auricular fibrillation .. | 49 | Tryparsamide in trypanosomiasis .. | 474 |
| — — subtotal, for exophthalmic goitre .. | 219 | Tubal pregnancy, contraception and .. | 371 |
| Thyronal dystrophy .. | 468 | Tuberculin in asthma .. | 60 |
| Thyrotoxic lymph system, cystic hygromas of neck and .. | 467 | — — hypersensitivity following erythema infectiosum .. | 182 |
| Thyrotoxicosis, thyrectomy in treatment of .. | 466 | — Koch's old, in tuberculous prostate .. | 386 |
| | | Tuberculosis, artificial-light treatment .. | 355 |
| | | — biocholine in .. | 524 |

| | PAGE | | PAGE |
|---|------|---|---------------|
| Tuberculosis of central nervous system | 475 | Ultra-violet light, examination of cerebro-spinal fluid by | 89 |
| — in children, diathesis in | 253 | — in preparation for skin-grafting | 435 |
| — of larynx, treatment | 273 | — treatment of corneal ulcers | 118 |
| — measles and its effect on | 307 | — leprosy | 278 |
| — of prostate | 386 | — report of the Medical Research Council | 191 |
| Tuberculosis, pulmonary | 476 | — of tuberculous prostate | 386 |
| — apical and subapical | 477 | Undulant fever | 496 |
| — bacteriology | 476 | Universal catch forceps, Taylor's (<i>Fig. 81</i>) | 537 |
| — complicating diabetes | 140 | Unna's dressing in varicose veins | 496 |
| — heliotherapy in | 355 | — paste boot in varicose veins | 496 |
| — pleurisy and | 365 | Uremia, blood-urea estimation and | 386 |
| — prognosis | 478 | — due to laryngectomy | 275 |
| — prophylactic vaccination | 476 | — prostatectomy, urea-concentration test and | 383 |
| — sudden onset | 479 | — sudden visceral decompression | 507 |
| Tuberculosis, pulmonary, surgical treatment | 481 | Urea hydrochloride in hydrocele | 506 |
| — anaesthesia | 483 | — in myocardial insufficiency | 408 |
| — classification of patients | 482 | — nephrosis | 408 |
| — indications and results | 481 | — and sodium iodide in intravenous urography | 258 |
| — therapeutics | 479 | Urea-concentration test for uramia due to prostatectomy | 383 |
| — X-ray diagnosis | 514 | Ureter, diseases of | 498 |
| — renal (<i>see</i> Kidney) | 308 | Uteral stricture in etiology of calculus | 499 |
| — of skin, measles and | 308 | Utereropyelonephrostomy | 262 |
| — spine (<i>see</i> Pott's Disease) | 577 | Uterero-uterel anastomosis in diseases of ureter | 499 |
| — sanatoria for | 577 | Ureters, calculus in | 498 |
| Tuberculosis, surgical | 483 | — deformities of | 259 |
| — bone-pegging in joint disease | 488 | — implantation into bowel | 63, 499 |
| — of the larger joints | 486 | Urethane in hygonia | 328 |
| — Pott's disease (<i>see</i> Pott's Disease) | 486 | — varicose veins | 504 |
| — treatment | 485 | — vascular nevi | 324 |
| — tracheotomy for laryngeal diphtheria and whooping-cough and | 509 | Urethra, rupture of | 500 |
| Tuberculous pericarditis | 351 | — pelvic fractures and | 197 |
| Tuberculous peritonitis | 352 | Urethral irrigator nozzle, all-metal (<i>Fig. 142</i>) | 553 |
| Tuberculous ulcers of tongue | 469 | Urinary antiseptic, neotropin, a new | 527 |
| — virus, erythema exudativum multiforme and | 180 | — constipation | 261 |
| Tularæmia | 489 | — control, perineal prostatectomy and | 382 |
| Tannins (<i>see</i> under various organs, etc.) | 308 | — tract, X-ray examination of | 518 |
| Tanninell's anti-measles diplococcus goat or horse serum | 308 | Urine, deviation of, in bladder conditions | 63, 67, 499 |
| Tarbinal hypertrophy, treatment | 333 | — diastase content of, in pancreatitis | 344 |
| Typhoid fever (<i>see also</i> Paratyphoid Fevers) | 490 | — examination of, in juvenile diabetes | 140 |
| — epidemiology | 490 | — post-operative retention of | 10 |
| — etiology | 491 | — catheterization in | 65 |
| — importance of early blood-cultures in | 492 | Uritone (hexamine) solution, indications | 529 |
| — prophylaxis | 493 | Urography, excretion, in kidney diagnosis | 519 |
| — symptoms and complications | 491 | — intravenous | 257, 518 |
| — treatment | 493 | Uroselectan in X-ray examination of urinary tract | 257, 518, 529 |
| — inoculation in crews of merchant vessels | 493 | Urotropine in epilepsy due to epileptic encephalitis | 172 |
| — duration of immunity | 493 | — post-operative retention of urine | 10 |
| Typhus fever | 494 | Urticaria, adrophine Rx. "B" in | 524 |
| — in children | 495 | — due to filarial toxin | 189 |
| — epidemiology | 494 | — produced by hypersensitivity to insulin treatment | 149 |
| — etiology | 495 | Uterine bleeding, severe, radium treatment | 395 |
| — prophylaxis | 495 | — body, carcinoma of, treatment | 395 |
| — symptoms and complications | 494 | — cervix (<i>see</i> Cervix Uteri) | 395 |
| Tyrosinase, radium treatment and | 398 | — fixation forceps (<i>Fig. 82</i>) | 500 |
| ULCER, duodenal (<i>see</i> Duodenal Ulcer; Gastric and Duodenal Ulcer) | 398 | Uterus: chronic cervicitis | 500 |
| — gastric (<i>see</i> Gastric and Duodenal Ulcer) | 398 | — perforation by chorion during pregnancy | 373 |
| — ulceration, chronic, due to handling of radium | 398 | VACCINATION (<i>see also</i> Small-pox) | 501 |
| — ulcerative colitis (<i>see</i> Colitis, Ulcerative) | 492 | — epidemiology | 501 |
| — gastritis complicating typhoid fever | 492 | — intrauterine | 502 |
| — perforation, abortion and | 371 | — as a means of arresting whooping-cough | 509 |
| Ulcers | 495 | — in prophylaxis of pulmonary tuberculosis | 476 |
| — cornel, due to Casserian ganglion injections | 330 | — suitable time for | 501 |
| — treatment by ultra-violet light | 118 | — symptoms and complications | 502 |
| — due to gonorrheal proctitis | 221 | — technique | 501 |
| — intestinal, spine and | 447 | Vaccine, autogenous, in sensitization to dental sepsis | 132 |
| — leprosy, iodoform in | 278 | — therapy in amebic dysentery | 17 |
| — varicose, treatment | 495 | — chaneroid | 93 |
| — — by tannic acid | 86 | | |
| Ultra-violet light as an aid to calcium assimilation | 129 | | |

| | PAGE | | PAGE |
|--|----------|---|---------------|
| Vaccine therapy in chronic rheumatic diseases | 529 | Voelcker's operation in cancer of bladder | 68 |
| — gonococcal arthritis | 224 | Vomiting under anaesthesia | 38 |
| — gonorrhoea | 223 | — of pregnancy | 352, 377 |
| — mental diseases related to sphenoidal sinusitis | 314 | Von Jaksch's anaemia | 19 |
| — pyogenic infections | 393 | Von Pirquet reactions, tuberculous infection and | 477 |
| — rheumatism and arthritis | 416 | Von Winckel's disease | 330 |
| — septicæmia | 392 | Vulsellum forceps, Douglass's (<i>Fig. 84</i>) | 537 |
| — sprue | 447 | Vulva, carcinoma of, diathermy in | 395 |
| — typhoid fever | 493 | — radium in | 394 |
| — ulcerative colitis | 105 | — pruritus of | 387 |
| — undulant fever | 497 | — X-ray treatment | 521 |
| Vaccinia, generalized, following vaccination | 502 | WARTS , treatment | 236 |
| Vagina, carcinoma of, radium in | 394 | — Wassermann reaction in meningitis | 91 |
| Vaginoscope, new electric (<i>Fig. 143</i>) | 553 | — syphilis | 453 |
| Vagus, stimulation of, cause of asthma and | 58 | Water ingestion, diuresis produced by | 409 |
| Valerian in alcoholism | 11 | Watermelon seed in high blood-pressure | 73 |
| Vaquez-Osler disease | 182 | Weill's disease | 251 |
| — X-ray therapy | 182, 522 | Wheat in diet, dental caries and | 128 |
| Varicella (<i>see</i> Chicken-pox) | 505 | Whooping-cough | 509 |
| Varicocele, injection treatment | 495 | — Pott's disease and | 484 |
| Varicose ulcers, treatment | 86 | — symptoms and complications | 509 |
| — by tannic acid | 504 | Willett's cranial forceps in placenta prævia | 268 |
| Varicose veins | 504 | Winckel's (<i>von</i>) disease | 330 |
| — injection treatment | 504 | Witzel type of enterostomy, plea for | 20 |
| — — contra-indications | 504 | Word-deafness, congenital | 60 |
| — — embolism and | 378 | Worms, calcified, X-ray diagnosis | 521 |
| — — technique | 505 | | |
| — sodium morrhuate in | 528 | X-RAY diagnosis | 510 |
| — treatment by ligating saphenous vein | 504 | — in acute hæmatogenous perinephric abscesses | 263 |
| Variola (<i>see</i> Small-pox; Vaccination) | 263 | — appendicitis | 518 |
| Varix papillæ | 489 | — apudric necrosis of lung | 290 |
| Vaseline injections in tuberculous joints | 333 | — arthritis | 416, 418 |
| — in perforated nasal septum | 432 | — aseptic necrosis in epiphysis of first metatarsal | 511 |
| — sycosis barbae | 537 | — bone changes in Gaucher's disease | 512 |
| Vasostomy forceps (<i>Fig. 83</i>) | 426 | — cysts | 513 |
| Vasotomy in seminal vesicle infection | 229 | — growths in mummies | 513 |
| Vaughan-Thompson technique for hare-lip and cleft palate | 128 | — lesions in syphilis | 513 |
| Vegetables, green, dental caries and | 69 | — bronchial obstruction | 515 |
| Veins, varicose (<i>see</i> Varicose Veins) | 73 | — bronchiectasis | 84, 85, 515 |
| Vena cava, inferior, ligation of | 377 | — calcification of pericardium | 551, 516 |
| Venesection in high blood-pressure | 378 | — calcified worms | 521 |
| Venoclysis in emesis gravidarum | 377 | — cholecystography | 203, 519 |
| — rate of transfusion and pulse-beat | 377 | — of diaphragmatic hernia | 239 |
| — technique | 377 | — diseases of upper respiratory tract | 517 |
| Ventilation of the X-ray room | 510 | — diverticulitis | 107, 156, 517 |
| Ventriculin (desiccated hog's stomach) in pernicious anaemia | 24, 529 | — encephalography | 513 |
| Ventriulography in diagnosis of intracranial tumours | 77 | — of greater trochanteric injuries | 511 |
| Version in placenta prævia | 268 | — ha-mandoma of bone | 512 |
| Vertebra (<i>see</i> Spine) | 323 | — hysterosalpingography | 520 |
| Vertigo in diagnosis of head injuries | 167 | — of intracranial calcifications | 514 |
| — labyrinthine, treatment | 386 | — intrathoracic tumours | 295 |
| Vesical (<i>see</i> Bladder) | 386 | — lymph-nodes in mesentery | 302 |
| Vesicles, seminal, infection of, prostatectomy and | 426 | — marble bones | 512 |
| Vesicles, seminal, surgery of | 88 | — massive collapse of lung | 292, 515 |
| Vesicular eruption as a complication of cerebrospinal fever | 426 | — mediastinitis | 516 |
| Vesicectomy in the insane | 208 | — myelomatosis | 513 |
| Vibrio septique in gas gangrene | 420 | — nucleus pulposus and | 513 |
| Vigantol in rickets | 493 | — of oedema of lungs | 515 |
| Vincent's anti-typhoid vaccine | 162 | — opacities of thorax | 515 |
| — infection of the ear | 529 | — os calcis deformities | 511 |
| Vioosterol 'A & H', pharmacology | 507 | — ossifying capitulum | 511 |
| Visceral decompression | 448, 508 | — osteomalacia in pregnancy and rickets | 512 |
| Visceroptosis | 127 | — phthisis | 514 |
| Vitamin, antiscorbutic, deficiency and dental caries | 62 | — pneumoconiosis | 515 |
| — B in treatment of beri-beri | 191 | — pneumopericardium | 231, 516 |
| — content of honey | 190 | — polyposis of colon | 105 |
| — D in food | 349, 350 | — pseudo-fractures | 512 |
| — deficiency, pellagra and | 529 | — pyelography | 257, 519, 529 |
| Vitasac, a new infant food | 529 | — of renal tuberculosis | 265 |
| | | — rickets | 512 |
| | | — separation of epiphysis of lesser trochanter | 511 |
| | | — spinal injuries | 441 |
| | | — subphrenic abscess | 450 |

| | PAGE | | PAGE |
|---|---------------|--|----------|
| X-ray diagnosis of urinary lithiasis | | X-ray therapy in erythraemia | 182, 522 |
| — examination of breast | 520 | — gonococcal arthritis | 523 |
| — chest | 514 | — intrathoracic tumours | 389 |
| — in measles | 307 | — in mediastinal tumours | 387 |
| — coronary thrombosis | 40 | — Paget's disease of nipple | 331 |
| — in dentistry | 136 | — papilloma of larynx | 274 |
| — of diaphragm | 516 | — pituitary tumours | 361, 362 |
| — duodenal niche | 517 | — pruritus ani et vulvae | 521 |
| — foot | 236, 237 | — renal actinomycosis | 265 |
| — foreign bodies in scalp | 520 | — sarcoma of stomach | 449 |
| — gall-bladder | 518 | — sycosis barbae | 432 |
| — gastro-intestinal tract | 518 | — xanthomatosis | 522 |
| — heart | 235 | Xanthoma | 510 |
| — imperforate anus | 402 | Xanthematosis, X-ray therapy | 522 |
| — lungs for localization of tuberculous lesions | 477, 478, 479 | | |
| — mechanism of swallowing | 517 | Y | |
| — nasal sinuses | 326, 520 | YATREN in amoebic dysentery | 17 |
| — oesophagus in dilatation treatment | 337 | Yaws | 522 |
| — pinéal body | 514 | — epidemiology | 523 |
| — pneumoperitoneum | 214 | — hereditary transmission | 522 |
| — renal rickets | 409 | — neosalvarsan in treatment | 523 |
| — sac contents in spina bifida | 441 | — syphilis and cross-immunity | 522 |
| — stomach residue | 517 | Yeast cells, proliferase a preparation of | 528 |
| — suprarenals | 520 | — irradiated, in treatment of rickets | 420 |
| — teeth of psychotic patients | 315 | Yellow fever | 523 |
| — tumours, diagnostic value | 522 | | |
| — urinary tract | 259, 529 | | |
| — — during operation | 518 | Z | |
| — irradiation of ovaries, effect on fetus | 374 | ZEPHROL as a nasal spray | 529 |
| — localization of lung shadows | 516 | — Zinc oxide in sycosis barbae | 432 |
| — room, ventilation of | 510 | — sulphate injections in surgical tuberculosis | 485 |
| X-ray therapy (see also Radiotherapy) | 521 | — ointment in lupus vulgaris | 301 |
| — in cancer of breast | 81 | — in sycosis barbae | 432 |
| — lip | 283 | — in treatment of epidemic conjunctivitis | 108 |
| — prostate | 386 | Zondek-Aschheim test for pregnancy | 371 |
| — chorioneplithelioma | 395 | Zoster, blood-serum treatment | 240 |
| — corns | 236 | — complicating epidemic encephalitis | 172 |
| | | Zygomatist mastoiditis | 165 |

THE MEDICAL ANNUAL, 1931

A Review of the Year's Work in the Treatment of Disease

INTRODUCTION

BY THE EDITORS.

IN presenting to our readers another volume of the MEDICAL ANNUAL, we think they may be interested if we render a brief account of our stewardship. The function of the ANNUAL, we take it, is to furnish a digest of the world's medical literature, critically considered and reduced to a small bulk by competent authorities. Our net is cast wide, but by far the greater number of the articles examined find their way into the waste-paper basket. Either they record rare cases which we do not consider it our province to publish, or more often they grind out over and over again information which a reader of our previous numbers has already had put before him. As a rule we do not include pathology, or details of animal experimentation, or mere theories.

On the other hand, our purpose is to take note of new or improved methods of diagnosis and treatment that promise to be useful, wherever they may be published. To this end the leading foreign medical periodicals are regularly consulted, including German, American, and French digests of a yet wider range of publications, sometimes in out-of-the-way languages. It will be observed, for instance, that in the section on abdominal surgery there are references to papers from the following sources: American 54, British 32, German and Austrian 22, French 15, Italian 5, Dominions 4, Russian 3, Swiss 2, Spanish 2, and Chinese, Egyptian, Scandinavian, and Central American 1 each.

It is sometimes complained that there has been nothing over several years about such and such a common ailment. The reason is obvious; the medical literature for the year has not contained anything of value on the subject. To meet the need, however, we publish from time to time a review of the best current opinion with regard to such conditions as do not happen to have been noticed much of late. We include this year a section on diseases of the teeth, which it is hoped will be useful to dental surgeons as well as to doctors.

If it is objected that the book is too large for a busy practitioner to read through, we may reply, first, that many do read it through, and further, that the Introduction attempts to give in the smallest possible

compass what seem to us the outstanding advances, and the book is ready on the shelves when the difficult case turns up.

The foregoing remarks have been prompted by our customary survey of the contents of this current volume, which display in every department of medicine some attempt at an advance in the cure, relief, or prevention of disease. Two points of great potential importance to practitioners are brought out in the articles on food and the public health. The first is that relating to botulism, a form of food poisoning fortunately rare, in which the central nervous system is attacked, diplopia being an early symptom. The mortality is high, but life may be saved by timely administration of antitoxin (to be obtained at the Ministry of Health and many of the Health Offices of the large towns). In the same article we learn that in this country the eating of ducks' eggs is an appreciable source of food poisoning. In this connection also we may note that the increasing incidence of undulant fever, of the kind due to *Brucella abortus*, is thought by many observers to be traceable to an increase in the consumption of unpasteurized milk, which, if derived from an infected cow, may transmit the infection, just as that of *Brucella melitensis* is conveyed in the milk of infected goats.

Among the problems of every-day practice none is more refractory than that of the chronic ulcer of the leg. Claims are made in this volume on behalf of treatment by firm strapping of the affected limb, to the effect that this cures all cases painlessly, without laying the patient up, and without fear of recurrence. Should these claims prove true (and they are widely supported), a great advance has been made. In any case the simplicity of the plan commends it for further trial.

The same may be said of the 'hydration treatment' that is put forward as effecting great relief in epilepsy. This consists of a plan of diet which gradually cuts down the patient's intake of fluid. Details of this plan are given. Another distressing neurological problem—the treatment of the post-encephalitic Parkinsonian—continues to attract a good deal of attention; and stramonium, closely related to the hyoscyamus and hyoscyne which have been largely used, is thought by some to excel these. It is also remarked that, whereas pregnancy occurring in one of these patients tends to make the nervous symptoms worse, the pregnancy itself has an average chance of running a normal course. Transmission of the infection to the fetus is very rare. An interesting account of Lindau's disease is given. In this, hæmangioma of the cerebellum, often cystic, is contemporaneous with angiomatosis of the retina, pancreas, etc. Possibly recollection of the existence of this syndrome may lead to its recognition in individual cases and thus to successful surgery.

The treatment of colitis, catarrhal and ulcerative, is set forth in detail. Local direct treatment of the colon by enemata is regarded as the most important thing. The three main types of injection used are the starch and opium, the colonic wash, and the medicated enema. These three correspond roughly to three stages in the treatment. For the final stage albugin is recommended, 20 gr. to 30 oz. of normal saline, of which

25 oz. can be injected into a person of average size. A kindred malady, that of diverticulitis, discussed in detail in this volume, is also treated by systematic lavage of the bowel with normal saline and also with enemata of olive oil or paraffin. Detailed instructions as to diet are given. A note on operative indications appears in the article on surgery of the colon.

A point of some importance is that relating to the extraction of septic teeth in patients with ulcerative endocarditis. The belief that dental sepsis is a possible source of systemic disease is supported by the fact that the extraction of infected teeth may be followed by inoculation of a cardiac valve so closely as to leave no doubt that the one is the cause of the other. If persons with damaged valves have septic teeth that must be removed, it must be done gradually and with the utmost care.

High arterial tension is so widespread and so obnoxious a disorder that a continuance of the search for remedies is not to be wondered at. Two are particularly commended this year: acetylcholine, which may be used when sharp reductions must somehow be made; and watermelon seed, which contains a glucoside, cucurbititrin.

Alcoholism, and drug addiction generally, continue to claim a number of victims, if one may judge from the steady flow of papers on these subjects. These still display some division of opinion as to the relative wisdom of sudden or of gradual withdrawal of the narcotic that is being taken. The inclination of most is towards a gradual weaning, because it is less distressing and interferes less abruptly with metabolism. Everyone is agreed that at the back of these habits there is nearly always an inborn instability which makes recurrence very probable.

An article on anorexia nervosa claims that every such patient can be persuaded to eat normally. On the other hand, we are warned that the young child who refuses to eat has usually some valid reason for doing so. Loss of appetite is a very definite departure from the normal, and when it goes so far as to involve its subject in serious wasting, one cannot but think that it owns a tangible cause. We have noted recently an interesting claim, to the effect that the severe anorexia of young girls can be met by small doses of insulin with 'covering' rations of glucose. This plan appears worthy of trial.

A discussion of the traumatic neuroses includes a statement that "the prognosis depends almost entirely on whether the patient is in receipt of compensation or not". Of 23 compensation cases only 4 recovered, and these only on receipt of a lump sum payment; while of 17 non-compensated cases 12 recovered. It is said here also that "those who are absorbed in their calling but rarely develop functional nervous disorders" after trauma.

There have been renewed attempts to discover a means of giving insulin by mouth, but these do not seem to have succeeded. There is, however, an increasing belief in the power of insulin to make the diabetic patient fit for surgical operation. Probably this is due to more than one factor. One of these is the reduction of sugar in the circulatory

blood and in the tissues. Doubtless an excess of sugar in the tissues favours the growth of bacteria and thus increases the risk of sepsis. Perhaps even more important is the action of insulin in rendering the circulatory sugar available for the building of new leucocytes and other cells required in the process of repair.

We have already noted, under anorexia, a new field for the use of insulin. Another is proposed in the article on diphtheria, where we are told that for toxic cases large doses of antitoxin are necessary, and that these are rendered more effective if at the same time dextrose and insulin are also given. On the other hand, the value of scarlet fever antitoxin, in this country at any rate, seems doubtful, since the incidence of anaphylactic phenomena following its use is high. If it has a field of usefulness it is "in its power to alleviate the toxic symptoms of the acute stage, while it has little or no action in preventing or curing complications".

The increasing use of iodine compounds to throw up X-ray shadows of channels within the body must cause some misgiving as to the possibility of unwelcome after-effects, such as we have had occasion to notice in previous volumes; or, at all events, must lead us to ask whether the probability of drawbacks is outweighed by the expectation of advantages. However, the injection of lipiodol into the bronchial tree for the purpose of defining the extent of bronchiectatic cavities is, we are told, not merely innocuous but actually beneficial. It is also claimed that good may be done in early cases of the same disease by bronchoscopic treatment—a plan which is even more warmly praised as a means of curing abscesses of the lung. These are more often seen in America than in Europe, and it is suggested that this may be due to a difference of posture in tonsil operations, which precede the formation of a majority of such abscesses.

That there is an increase in the incidence of new growths within the lung seems to be proved. A review of this subject leads to the conclusion that so far neither surgery nor radium has proved able to do much. There is, indeed, no cure for these growths, though they offer a fair target for the chemotherapist.

Recent studies of internal secretion have been fruitful. For example, the existence of a hyperinsulinism analogous with hyperthyroidism has been proved to exist in the presence of certain tumours of the pancreas, and is also advanced as an explanation of certain nervous disorders of childhood. Its danger lies in the reduction of the blood-sugar that must inevitably ensue upon a progressive increase in the supply of insulin. This may lead to an alarming nervous syndrome, combated successfully in most instances by increasing the patient's intake of glucose.

The number of cases in which removal of a cyst or tumour from the parathyroid gland has been followed by a regression of osseous disease seems to prove that here also a new line of advance has been opened up. The appropriate cases are those in which osteitis fibrosa is accompanied by a high level of calcium within the blood. Not only have the

bony lesions improved rapidly, but also the calcium metabolism has become normal. There is apt to be an embarrassing period of tetany, to be met by large doses of parathormone and calcium chloride. Interesting work on the thyroid and pituitary glands is also recorded.

The somewhat alarming outbreak of psittacosis, commented on in the last volume, seems to have spent itself, thanks to prohibition of the importation of South American parrots. The exciting cause is probably a filtrable virus. No satisfactory specific has been discovered. In fact, the year has not produced a new antidote for any infection, although it has strikingly confirmed the value of antimony in kala-azar and also in localized leishmaniasis of the skin. Antimony also continues to prove efficacious in the treatment of bilharzial disease. Among arsenicals used in trypanosomiasis, 'Bayer 205' and tryparsamide continue in favour.

This action of arsenic and antimony in the parasitic infections is one of the most established facts in the whole range of pharmacology, yet there is a disposition to doubt whether their action is as immediately parasitocidal as has been thought; or whether they may not act by enhancing the resistance of the body. Inquiries of this kind are at the back of some interesting tendencies in modern pathology. To two of these some allusion may be made. In the first place, there is the fact that persons with a defective secretion of hydrochloric acid into the stomach are more liable than others to certain diseases. This relation has been most clearly established in cases of pernicious anæmia, and in the present volume much of the evidence supporting this conception is reviewed. But we learn also that in the asthmatic child a shortage of hydrochloric acid secretion is common—an observation that may prove of high therapeutic value. It is interesting to note, by the way, that true pernicious anæmia does occur even in childhood, and that large doses of liver are needed to arrest it. Further, there is said to be a severe anæmia that differs from the pernicious variety in its low colour index and also in its refractoriness to treatment by liver diet and extracts; which nevertheless is, like true pernicious anæmia, associated with deficiency in the secretion of hydrochloric acid and also, in many instances, with tongue changes. Large doses of iron are essential to the treatment of this condition.

Another group of diseases on the causation of which new light seems about to break is that in which the leucocytic picture is grossly and, one might almost say, unreasonably altered. Myeloid leukæmia, for example, proves to be much more often an acute illness than most of us used to think. The recognition of this fact is due to better means of staining leucocytes and thus of identifying those that come from bone-marrow. For a similar reason the group of cases labelled variously 'infectious mononucleosis' or 'glandular fever' is becoming better defined. It is not too much to hope that from studies such as these we shall find out something which may be of value in the treatment, and even in the prevention, of so serious a disease as leukæmia. In the meantime the use of radium and X rays in the treatment of this disease deserves a

wider application. In our experience these methods have done far more for the leukæmic patient than any other with which we are acquainted.

Again, the wide reach of the allergic phenomena receives increasing recognition. This year we are told that this process of sensitization—in a local sense this time—is partly to blame for certain varieties of occupational dermatitis. It is reasonable to hope that some day the bewildering maze of these reactions, and their relation to the establishment of immunity, may be so well understood as to open up new means of safeguarding people against infection. Moreover, this local sensitization is of particular interest when considered along with the claim of Besredka on behalf of 'antivirus therapy', an application to local lesions of filtered cultures of the causal organism—a remarkable example of the use of "the hair of the dog that bit him".

Among the more particularly surgical subjects, several points that often arise in general practice may be observed. The tannic acid method of treating burns, one of the greatest advances in therapeutics of recent times, is described, and it is pointed out that it is not suitable for the fingers, the buttocks, or the lips. The causes and treatment of painful heel are discussed; a pastille dose of X rays will usually cure corns in that situation. A better skin antiseptic than tincture of iodine is metaphen. An American committee concludes that post-operative radiation does not increase the five-year 'cures' in cases of cancer of the breast, but it prolongs life in cases of recurrence. Transillumination is being increasingly used for diagnosis—e.g., in breast cases—and also during abdominal operations.

Vascular surgery continues to attract attention. Removal of the sympathetic ganglia may benefit Raynaud's disease, and relieve the pain of Buerger's thrombo-angiitis obliterans. For the latter condition, tying the femoral vein often improves matters.

Operation for cholecystitis has not given particularly good results in the past, and the suggestion is made that diverting the bile into the stomach is more successful. An important investigation has been published giving the ultimate results of gastro-enterostomy for 2609 cases of gastric and duodenal ulcer; the mortality varied from 3 to 9 per cent, and about 90 per cent were greatly relieved or cured. Evidence is adduced that perforated gastric ulcer not infrequently recovers without operation. It seems the best results in acute pancreatitis are obtained when the gall-bladder as well as the pancreas itself is drained.

In the section on rectal diseases, figures are given of the successful treatment of cancer by radium. It is emphasized that the only way to avoid a fistula after ischiorectal abscess is to open it widely at the earliest possible moment.

If psychotherapy fails, some form of operation is often needed for spasmodic torticollis, and mere division of the spinal accessory nerve leaves the deeper cervical muscles still liable to spasm. Good results are reported after laminectomy and intraspinal division of the affected nerve-roots. It is pointed out that it is important to do a cerebral

decompression in the same compartment of the cranial cavity as that occupied by the tumour, or 'tumour drift' towards the opening may result, with new or increased symptoms, especially in advanced cases.

Three successful cases in which emboli were removed from the pulmonary artery are described. The pleura was not opened, but the artery was reached through the pericardium. A number of cases of bronchiectasis have been successfully treated by one-stage lobectomy. The value of avulsion of the phrenic nerve, and of thoracoplasty, for patients with pulmonary tuberculosis is discussed; good results can be obtained in well-selected cases.

Our contributor on surgical ailments in children reports on a method of treating rectal prolapse by plecting of the sphincter. A discussion of the varieties, diagnosis, and treatment of spina bifida is included.

In the section on bone and joint surgery, we are told that in Central Europe transfixion with a tightly stretched piano wire is now used instead of with a pin, to make extension on long bones in cases of fracture. An operation for fractured patella is described, using living fascia to encircle the bone instead of wire. Certain cases of early tuberculous arthritis can be effectually treated by injecting liquid paraffin.

In the section on genito-urinary surgery, mention is made of an excellent series of cases of ectopia vesicæ treated by implantation of the ureters into the colon.

A new section appears in this volume, on affections of the teeth. The value of proper diet, and of sunlight or cod-liver oil, is appreciated as a means of averting caries, and we learn that in America special school nurses are appointed to attend to children's teeth.

No startling advances have been made in the therapeutics of radium, but it is reassuring to read that the risks of cancer in radium workers appear to be very remote. On the other hand, women workers who apply radio-active substances to the luminous dials of watches may suffer from aplastic anæmia.

The review dealing with midwifery quotes excellent results in the treatment of placenta prævia when a submammary saline infusion is given before any active interference is attempted. Obstructed labour is often due to an undiagnosed occipito-posterior presentation; it is frequently impossible to make out the two fontanelles, but in cases of this malposition the two frontal bones can be moved the one on the other; the most reliable means of diagnosis is to give an anæsthetic and feel for the fœtus's ear. It is maintained that external rotation should be applied before labour begins by means of Buist's abdominal pads, to effect correction. In more advanced cases, manual rotation is advised.

It is stated that in Germany 15,000 women die annually as a consequence of criminal abortion, and many more suffer as a result of anti-conception methods. Experience of the Zondek-Aschheim test for early pregnancy is very favourable.

Various methods for using radium in cases of cancer of the uterus, and of menorrhagia, are discussed.

Ophthalmology has had a very good year. A new disease is recognized, a conjunctivitis due to the artificial silk industry. Good results are reported in cases of spring catarrh, hitherto intractable, by the use of lactic acid; radium is also well spoken of. 'Pink eye' (epidemic conjunctivitis) is getting more common; the causative organism must be identified in each case, as the treatment differs. A successful method of corneal grafting is described, and two methods of corneal tattooing. Another intractable disease, conical cornea, often responds well to contact glasses. Even for patients with detached retina there is hope in the new but rather difficult method of ignipuncture; "there are more authentic records of cures of retinal detachment published during the past year than can be put to the credit of all other methods of treatment during the past twenty years."

Considerable attention has been given lately to the connection between bathing and ear discharges. It seems established that patients with otorrhœa may suffer harm themselves, and infect the water so that others may develop otitis media by way of the Eustachian tube if the water is taken into the mouth. Hæmatoma of the auricle—"football ear"—is best treated by a punch rather than a linear incision. An audiometer has been introduced to give an exact record of hearing. The results of radium treatment for cancer of the larynx are claimed to be as good as those of surgery.

Coming to venereal diseases, we are told that gonorrhœal proctitis is best treated by silver-protein injections. The laboratory diagnosis of syphilis should rest on at least two tests, one of which should be a Bordet-Wassermann. This may save the patient from being looked upon as cured when he is not. Some animal experiments on rabbits go to show that our present methods of prophylaxis against syphilis are very unreliable, in spite of the faith placed in them by the Army and Navy. A means is described of detecting undue sensitiveness to arsenic compounds and thus avoiding a severe reaction after injection.

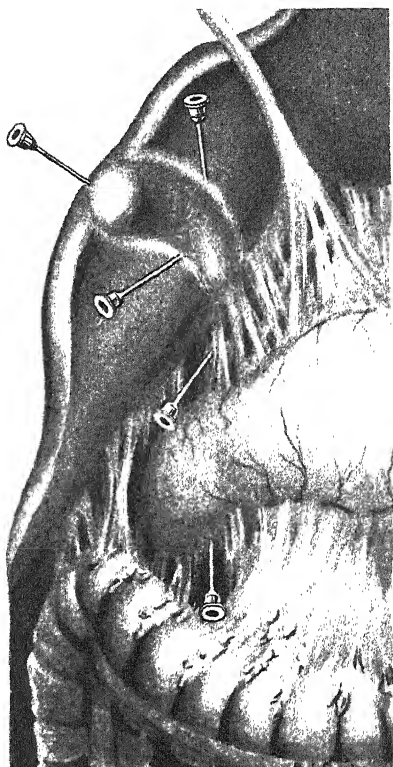
Much work has been done on various methods of inducing spinal anæsthesia. Novocain is apparently quite innocuous even when it reaches the medulla, and the whole body can be anæsthetized safely thereby. Percain injected under pressure with the patient turned on his face will reach the whole of the splanchnic-nerve area.

Lastly, discussing electrotherapeutic methods, our reviewer reports that good results can be obtained in cases of puerperal septicæmia by diathermy. Pruritus, anal or vulvar, may disappear after one or two applications of X rays. A substance called uroselectan has been introduced which, given intravenously, casts a shadow, with X rays, of the pelvis of the kidney and ureter, and may be used for this purpose instead of pyelography. This may prove a great advance.

PLATE I

CREEPING LOCAL ANÆSTHESIA

(A. WISHNIEWSKY)



By kind permission of 'Surgery, Gynecology and Obstetrics'

I

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

ABDOMINAL SURGERY, MISCELLANEOUS.*A. Rendle Short, M.D., F.R.C.S.*

Incisions.—H. B. Devine,¹ of Melbourne, warmly advocates the use of a four-bladed abdominal retractor arranged in a square, with four or more 'mechanical hands' to hold back the parietes and viscera. It is suitable for all abdominal and pelvic operations (see MEDICAL ANNUAL, 1928, *Fig. 27*, p. 174). If the stomach is distended, it should be collapsed by puncture and a suction pump; this greatly facilitates access. By means of the retractor the kidney can easily be explored or removed from in front. The bladder and prostate can be thoroughly displayed.

Creeping Local Anæsthesia.—A. Wisniewsky,² of Kasan (U.S.S.R.), describes his method of operating under local anæsthesia, using large quantities of a 0.25 per cent solution of **Novocain** with 2 drops of **Adrenalin** to 100 c.c. of solution. The abdominal wall having been infiltrated and incised for a gastric resection, novocain is injected into the transverse mesocolon and an œdematous area induced. Another injection is made at the edge of this, and so on, until the duodenum is embedded in an injected fluid. Then the lesser omentum is similarly injected along the lesser curvature; the gall-bladder may be dealt with similarly. The mesentery of the hepatic flexure having been infiltrated, the colon is drawn out of the way, and progressive injections are made under the peritoneal covering where the gall-bladder meets the liver, down to the ducts. The method has all the advantages of splanchnic anæsthesia without its drawbacks; it is easy, safe, and induces no fall of blood-pressure. (*Plate I.*)

Abdominal Injuries in Children.—F. Beckman³ presents a study of 59 cases, and arrives at the conclusion that, generally speaking, patients are more likely to recover without operation than with. Fatalities are usually due to multiple injuries or to laceration of the liver; tears of the spleen and intestine are much less frequent than in adults. Retroperitoneal hæmatoma was relatively common. Most of the fatal cases died within three or four hours, and could hardly have been saved by laparotomy. Of the 28 patients who recovered, 6 were operated on, 1 for ruptured spleen, 1 for torn bowel, and 4 for retroperitoneal hæmorrhage. Only in 4 of the 10 cases operated on was intervention really needed (for damage to spleen or intestine); of these, 2 died and 2 were saved. Beckman believes that cases of ruptured liver are more likely to live if *not* operated on. Of 9 cases of injury to the kidney, only one died, and that after operation.

Adhesions.—E. H. Trowbridge⁴ maintains that, if adhesions operated on for the relief of pain are divided with the electro-surgical knife instead of with the scalpel, they will not re-form, and quotes five cases free from pain after such treatment. He uses light dehydration, low voltage, and power control 40. It sounds too good to be true, but is worthy of trial.

A full discussion of the subject of abdominal adhesions is given by P. Clairmont and M. Meyer,⁵ of Zurich, who present a study of material from six

Central European clinics. No less than 80 or 90 per cent of re-laparotomies show some amount of adhesions. Of those cases that come to a second operation on account of symptoms of adhesions, the majority had been treated in the first place for appendicitis, gynaecological conditions, gall-bladder troubles, or ulcer of the stomach; obstruction symptoms were more likely to follow pelvic operations, and pain when the upper abdomen had been opened. Very full tabulated details are given. Nervous and mental symptoms are common in these patients, as well as pain and semi-obstruction. Treatment by re-operation is not satisfactory. In the Zurich clinic, of 44 operated on for obstruction symptoms, 30 per cent died; of the survivors 63 per cent were relieved of their pain; of those explored for pain, 8 per cent died, and only 40 per cent were freed from their symptoms. The operation may take the form of dividing the adhesions or excising the adhering viscera.

Fistulae.—Tui⁶ recommends the liberal application of **Kaolin Powder** rather than ointments for the protection of the skin around gastric or intestinal fistulae opening through the abdominal wall.

Suppurating Deep Iliac Glands.—Hamilton Bailey⁷ says that this condition is not uncommon, and is likely at first to be mistaken for appendicitis or acute arthritis of the hip. The onset is sudden, with pain in the groin, often vomiting, and psoas spasm. The temperature may or may not be raised. Eventually an extraperitoneal abscess is likely to be formed and to need opening.

Post-operative Retention of Urine.—Fiorini,⁸ of Verona, finds the intravenous injection of urotropine (see MEDICAL ANNUAL, 1926, p. 47) ineffectual, but in 92 per cent cases **Pilocarpine** is successful. It may be given intravenously (dose, 8 mgrm. = $\frac{1}{8}$ gr.) or per rectum (dose, 3 grm. = $\frac{1}{2}$ gr.). [Our brief experience is favourable. It induces a profuse sweat.—A. R. S.]

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, Feb., 455; ²*Ibid.* May, 879; ³*Ann. of Surg.* 1923, Aug., 206; ⁴*New Eng. Jour. Med.* 1929, Dec., 1183; ⁵*Arch. f. klin. Chir.* 1929, Nov., 474; ⁶*Ann. of Surg.* 1930, Jan., 123; ⁷*Practitioner*, 1930, Feb., 223; ⁸*Policlinico*, 1930, June, 797.

ABSCESS OF THE BRAIN. (See EAR, DISEASES OF.)

ABSCESS OF LIVER. (See AMOEBIASIS; LIVER, SURGERY OF.)

ABSCESS OF LUNG. (See LUNG, ABSCESS OF.)

ACTINOMYCOSIS. (See SKIN, FUNGUS INFECTIONS OF.)

ACTINOMYCOSIS, RENAL. (See KIDNEY, SURGICAL AFFECTIONS OF.)

ALASTRIM. (See SMALL-POX.)

ALCOHOL AND DRUG ADDICTION. Henry Devine, M.D., F.R.C.P.

ALCOHOLISM.

Psychotherapy in Alcoholism.—R. R. Peabody¹ writes on psychotherapy for alcoholics. He observes that from the alcoholics as a class certain groups can be eliminated as unfitted for psychotherapy. One consists of psychotic subjects; another is comprised of those who do not sincerely wish to help themselves; and a third group, with which only partial success can be expected, includes those who are psychopathic personalities or constitutional inferiors. In suitable cases the treatment suggested comprises therapeutic conversations without deep analysis; light hypnosis, without total amnesia,

with positive suggestions; directions as to the practice of autosuggestion; and re-enforcement of the control and direction of the conscious thought processes. It is considered by the writer that as a means of re-integrating a demoralized person as quickly as possible (provided he is not nervously exhausted) nothing is as helpful as a daily schedule made out by the patient himself, and then adhered to unless common sense makes such adherence illogical. The schedule prevents idleness, makes the patient conscious that he is doing something concrete about his condition, and—most important—develops, through many small acts, an ability to sustain constructive conduct. Certain books, such as William James's monograph on habit, are recommended for home reading. The writer feels that, given a sincere and intelligent person who was reasonably integrated (even if of marked nervous temperament) before alcohol demoralized him, the prognosis is good, provided time enough is given to the treatment; but that even under the best conditions satisfactory results are obtained only through hard, painstaking work, so that, unless much effort is to be wasted, candidates for treatment should be selected in the beginning with a certain amount of discrimination.

W. Brown² also discusses the rôle of psychotherapy in the prevention and treatment of alcoholism and other drug addictions. The general view is expressed that in those who are beginning to give way to alcoholism, or have already succumbed, there is always evidence of previous inadequacy in facing the problems of life. There is often a bad heredity, and, because the patient is generally aware of this, he hardly expects to benefit from the treatment. There are two lines of treatment—one the method of mental analysis, and the other the method of direct personal influence. The *method of analysis* is partly a method of investigating psychological causes, the general method of encouraging the patient to talk-out his life fully, deploying his mind to the utmost in the presence of the analyst. That process of talking-out not only gives him and his analyst an increased insight into his mind, but also relieves repressions of one kind or another from which he is suffering. It also brings about an affective *rapproch* by virtue of which the patient becomes more suggestible to the physician, more and more ready to take the physician as his guide. Alcohol should be taken off completely. If patients are seen at the early stage, it is well not to tail off, but to stop dead and take no further alcohol at all. If living at home, it is advisable to prescribe a mixture of **Bromide and Valerian** or of **Bromide, Nux Vomica, and Sal Volatile**. The mild cases do respond, Brown states, to analytical treatment along these lines, provided one is prepared to adopt the attitude of director over them, not merely to analyse, but to encourage them to get a new philosophy of life and to cultivate new interests. In advanced cases, if not in an institution, the patient should have a companion. In such cases **Hypnotic Suggestion** is of value, as the advanced type are readily hypnotized, and under hypnosis accept suggestions which otherwise it would be impossible for them to respond to.

Delirium Tremens.—E. F. Wills³ observes that to those engaged in the treatment of alcoholism the treatment of delirium tremens may be simple enough, but to those engaged in general practice it does not seem to be widely known. Put briefly it is: Find the tolerance and taper carefully. Some regular drinkers are in constant dread that they will not secure the next allowance. They know that unless they do they are in for trouble—in other words, they are aware that they have acquired a tolerance for alcohol, and to be deprived of alcohol immediately arouses a violent intolerance. Sedatives are of no avail. The only way to deal with a very serious condition of things is to find out what they are used to: let it be a bottle of whisky in the twenty-four hours. Then begin at, say, 8 a.m. and continue every two hours until

2 a.m., each dose to be 2 oz. of whisky. This will give the patient his bottle of 20 oz. It will have a quietening effect, the pulse will become normal, and the excited movements and tremors will disappear. Having got him quiet and safe, then begin to reduce the amount of whisky given at each dose. On the following day give $1\frac{1}{2}$ oz. every two hours. This reduce by 5 oz. the next day, and so on.

Absinthe.—C. W. J. Brasher¹ calls attention to the increase of absinthe-drinking in England. He points out that although the manufacture and sale of absinthe were prohibited in Switzerland in 1908, in Italy in 1913, and in France in 1915, the sale of absinthe is unrestricted in England. The countries whence absinthe is consigned to England are the Netherlands, France, and Spain, and the total quantity imported from all three countries during the last nine years is 14,428 gallons. As the majority of cocktail or absinthe drinkers take only a few drops of the liqueur in each glass, it is obvious that this total indicates that a large number of persons drink this highly toxic beverage, and at any time, if it became fashionable, the annual consumption of absinthe would increase rapidly. Brasher thinks that the question of the prohibition of the importation and sale of absinthe in England should be considered on its merits, apart from any question of general prohibition of alcohol. Although the alcoholic content of absinthe is higher than that of any other beverage, it is evident that alcohol is not the toxic agent but the vehicle of the highly toxic vegetable oils which are responsible for the deleterious effects of absinthe.

Therapeutic Use of Alcohol.—J. D. Rolleston⁵ writes on alcohol in therapeutics and summarizes his study as follows: (1) A remarkable decline has taken place within the last thirty years in the use of alcohol for therapeutic purposes. This is best illustrated by the fall of the alcohol bill in various hospitals, and is also exemplified by the practice of individual physicians and the small place which alcohol now occupies in text-books of medicine. (2) The low esteem in which alcohol is held as a therapeutic agent in the United States is shown by the fact that only a minority of practitioners apply for a licence in those states in which the right to prescribe alcohol is granted, while a considerable proportion of this minority use it for illicit purposes. (3) The conditions in which alcohol is still employed are pneumonia, enteric fever, diphtheria, and other acute infections, diabetes, heart disease, tuberculosis, inoperable cancer, and senility, but it does not appear to be indispensable in any of them. (4) The experience at the Western Hospital has shown that in the annual population of over 5000 patients the consumption of alcohol can be practically reduced to nil without any injurious effects. (5) The factors chiefly responsible for the undeserved esteem which alcohol still enjoys as a therapeutic agent are tradition rather than scientific evidence, extramedical influences, and personal considerations.

DRUG ADDICTION.

Mescaline.—D. N. Buchanan⁶ describes the physiological and psychological effects of mescaline. This is one of the alkaloids extracted from *Anhalonium lewinii*, a small cactus having roughly the size and shape of a radish. The Indians regard mescal as a panacea in medicine, as a source of inspiration, and as a key which opens to them all the glories of another world. Beringer, at the Heidelberg Psychiatric Clinic, investigated thirty-two cases of mescaline intoxication. The alterations he observed can be grouped under the following headings:—

1. *Smell.*—Increase of intensity so that smells hitherto unnoticed became disagreeably prominent. Hallucinations of smell also occurred.

2. *Taste*.—Variations in both intensity and quality of taste sensations were reported.

3. *Hearing*.—The auditory perceptions of the subjects varied a good deal in intensity, but on the whole sounds usually appeared louder than in normal circumstances, and the localization of stimuli was disturbed. The quality of sounds was changed—"the sound of a motor-car exhaust is like the music of a magnificent orchestra".

4. *Vision*.—The subjects showed many changes from the normal in the phenomena perceived. Brightness changed during the limits of the experiment. Alteration in the colour quality in some instances gave a distinct alteration in feeling tone. Visual sensibility showed an increased intensity for slight nuances of colour and contrast; there was an erroneous estimation of distance; and there was evidence of the appearance of movement. Visual illusions were present in practically all cases.

5. *Disturbances of Time Sense*.—With all persons used in the experiment there was a noticeable decrease in accuracy of judgement of time sense. Thus one subject hearing a man ascending a stair experienced a tremendous interval between each step.

6. *Co-ordination between the Senses*.—There was evidence, for example, of an interrelation between the perception of sound and the appreciation of colour sensations. The subject saw very clearly different colours as various notes were played on the piano.

7. *Alteration of General Sensations*.—Most cases reported alterations in sensation which showed the change more in the area of location than in the actual quality. Thus one reported that he had a curious sensation of coldness which was not in his skin but in his bones and muscles. To some there was an alteration in the character of objects. One said that metals did not feel hard and that they could be bent like wax. Buchanan deals very comprehensively with his subject, and the bibliography contains eighty-nine references.

K. Morinaka⁷ contributes a comprehensive and interesting article on chronic **Morphine Intoxication**, based upon his experience in China. The subject is dealt with from the etiological, physiological, pathological, and therapeutic standpoints, and a number of statistical tables are given. Unfortunately this paper does not lend itself to abstraction, but it should be consulted by those interested in the problem of drug addiction. It is of interest to learn that, in China, the opium-smoking habit has fast become, and is still becoming, replaced by morphine injection. Consequently the cases of morphine intoxication are much more frequent and common to-day than ever before, and perhaps the control or prohibition Act should be more strictly exercised. Certainly the opium habit and morphinism are more serious problems in China than they are in any other country.

J. D. Rolleston⁸ summarizes the problem of drug addiction in Egypt. His observations are based upon the first annual report of the Central Narcotics Intelligence Bureau, which has recently been issued by the Egyptian Government. The report deals with the activities of the 'white drug trade', or surreptitious commerce in heroin, morphia, hashish, and cocaine during the year 1929. The prevalence of narcotic addiction in Egypt is to some extent indicated by the statistics of the Prisons Department, which show that out of 24,192 inmates of the State prisons on Nov. 29, 1929, 7130 had been convicted under the Law on Narcotics—5317 for possession of the drugs, and 1813 for trafficking in them. As the majority of the traffickers are themselves addicts, at least one-quarter of the total population of the prisons are addicts. If these persons constitute, as is probable, only 1 per cent of the addicts in Egypt, there are roughly half a million addicts in a population of fourteen

millions. The writer quotes H. W. Dudgeon, who states that the great majority of addicts in Egypt start taking drugs for sexual stimulation in ignorance of the fact that after a very temporary stimulation the drug induces diminished desire, and is a common cause of impotence, finally rendering the addict a mental, moral, and physical wreck.

A. B. Light⁹ and his co-workers, to whose investigations we referred in the MEDICAL ANNUAL of last year (p. 19) have concluded their studies, which were designed to determine whether objective investigation would reveal any changes that can be measured by physical, chemical, or physiologic methods in the addict who is taking daily doses of from $\frac{1}{2}$ to 60 gr. of heroin or morphine that would differentiate him from a normal person, would serve to identify the state of opium addiction, or would provide indications to guide in his rehabilitation. It aimed to study by similar methods the addict during the period immediately after withdrawal of the drug at the time when he is suffering from 'withdrawal symptoms'. The findings are in the main negative, but nevertheless—and, indeed, from this fact—important. The study shows that morphine addiction is not characterized by physical deterioration apart from the addiction *per se*. There is no evidence of change in the circulatory, hepatic, renal, or endocrine functions. When it is considered that these subjects had been addicted for at least five years—some of them for as long as twenty years—these negative observations are highly significant. The study offers substantial grounds for the belief that, were it possible to relieve the addict of his addiction, complete rehabilitation could be expected. The abrupt withdrawal of morphine was accompanied by only slight changes in the physiologic mechanisms studied, changes which afforded no adequate explanation of the withdrawal symptoms. The re-administration of morphine during the period of the withdrawal symptoms was not accompanied by return to normal of those few positive observations characteristic of the withdrawal period, in spite of the apparent return of the addicts to a sense of well-being. Schneider's test of physical fitness and the staircase-climbing test indicated a poorer response than during the period of suffering. Following treatment and just before discharge from the hospital, the studies again indicate few changes except that the average leucocyte count was still high, a slight concentration of the blood still persisted, a slight rise in the average for the pH and lactic acid of the plasma, and a decided fall in the efficiency tests were found. These observations cannot be correlated with the behaviour of the patients. The study appears to the writers to be conclusive with respect to the physiological reactions of the addicts investigated. It indicates, however, the necessity for a study of the addict from some new standpoint in order to reveal the factors which induce and maintain the state of addiction, and which on abrupt withdrawal of the drug elicit withdrawal symptoms.

Kidney Function in Morphine Addicts.—R. A. Ackerly¹⁰ writes an eminently practical article on this subject. He points out that the controversy over the effect of morphine on kidney function has long been unsettled, and many physicians, particularly genito-urinary surgeons, are loath to give the drug even for severe pain, fearing it will increase the dysfunction in an already impaired kidney. If their fears can be dispelled, their patients will derive the benefits of rest with minimized post-operative pain to aid in their recovery. The writer finds: (1) Of 177 patients admitted for acute and chronic morphinism, 174 (98.4 per cent) showed no signs or symptoms of nephritis or kidney dysfunction. (2) Seventeen (9.6 per cent) showed urine containing albumin, casts, or red blood-cells, but 9 of these had diseases that might explain the finding in the urine, and none of the 17 had signs of urinary dysfunction; 11 patients had albumin and casts; 4 had albumin, casts, and red blood-cells, and

2 had red blood-cells and casts. (3) Three patients (1.6 per cent) exhibited signs, symptoms, and a urinalysis pointing to nephritis clinically; one of these had a floating kidney, and one was presumably a cardiac patient. (4) There is no evidence to show that there is a constant relationship between the administration of morphine and the manifestations of kidney dysfunction. (5) Morphine should therefore be used whenever indicated without fear of renal complications secondary to its use.

TREATMENT.

Alexander Lambert,¹¹ Chairman of the Mayor's Committee on Drug Addiction, New York, summarizes the results of the Committee's investigations. A total of 318 addicts was studied, a ward of the psychopathic division of Bellevue Hospital having been placed at the service of the committee. All the addicts treated were of the 'underworld' type. In the grouping of patients according to personality types, about 13 per cent were considered normal, 30 per cent were borderline, and more than 50 per cent were considered constitutionally psychopathic. In the last group were included emotional instability, criminalism, and paranoid personality. All the cases had been taking drugs over a considerable length of time, and very few would be considered useful members of society. None of the substances forming the basis of the so-called specific cures for drug addiction was found to have any value either for the amelioration or shortening of the withdrawal symptoms. This view was based upon the study of treatment with narcosan, atropine, scopolamine, and various depressants such as chloral hydrate. It is considered that the quickest and simplest method of stopping the addiction is that of *abrupt withdrawal* of the narcotic taken. Among the advantages of this method are the shortness of the time involved—three days as a rule—the avoidance of any complicated system of medication, an easier prevention of the addict's surreptitiously obtaining narcotics during the period, and finally an impressive mental effect on the addict, with a striking feeling of relief when the withdrawal stage is over. The disadvantages are the suffering involved—mild in many instances, but very severe in others—and the prostration and collapse, which may cause death. The abrupt withdrawal treatment should be limited to those addicts who on careful examination are found to have no serious organic degeneration or disease, are not of advanced age, and are not suffering from marked malnutrition. The most humane method is that of *gradual withdrawal*. Two weeks at least should be allowed for this reduction treatment. The great advantages of this method are the absence or diminution of severe suffering and its safety as regards collapse and danger to life. The disadvantages are the time involved, the absence of the favourable psychological effect of the abrupt withdrawal, and the greater and more prolonged vigilance required to prevent the addict from obtaining his narcotic.

The question of *rehabilitation* is a difficult one. No form of treatment for the withdrawal of addiction narcotics is in itself capable of stopping the craving for the drug. A withdrawal treatment by itself, therefore, is only an administrative routine, to be carried out as often as the addict receives a court sentence and with no probability of bringing about a lasting abstinence. (Clearly the same remarks are applicable in the case of those who submit themselves voluntarily to treatment.) The real problem is that of ridding the addict of his habit permanently or at least over a long period of time. On the whole, the possibility of rehabilitation in these cases is not viewed very optimistically. A considerable proportion of the cases are definitely psychopathic and prefer the up-and-down life of addiction to the more monotonous one of steady labour. For certain selected cases it is thought that it

might be possible to give **Sanatorium Treatment** with a view to rehabilitation. There would have to be made arrangements whereby the addicts would not be free agents until finally discharged. This means a binding commitment of some sort over a period of years for subjects in whom a favourable prognosis is made, and the privilege of discharging those from whom no good results can be expected. The staff would clearly have to be of exceptional character, eager for the success of the experiment, and willing to devote several years to the work.

REFERENCES.—¹*New Eng. Jour. Med.* 1930, June 19, 1199; ²*Brit. Jour. Inebriety*, 1930, April, 199; ³*Med. Press and Circ.* 1929, Aug. 7, 109; ⁴*Lancet*, 1930, i, 944; ⁵*Brit. Jour. Inebriety*, 1929, July, 1; ⁶*Brit. Jour. Med. Psychol.* 1929, May, 65; ⁷*Nat. Med. Jour. of China*, 1929, Jan., 764; ⁸*Brit. Jour. Inebriety*, 1930, July, 10; ⁹*Arch. of Internal Med.* 1929, July, 1; Aug., 194; Sept., 376; Dec., 862, 870; ¹⁰*Jour. Amer. Med. Assoc.* 1930, Jan. 2, 79; ¹¹*Ibid.* 1929, Oct. 26, 1297.

AMOEBIASIS. (See also LIVER, SURGERY OF.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

C. F. Craig¹ has recorded further details and results of his complement-deviation test for *Entamoeba histolytica* infections (see MEDICAL ANNUAL, 1929, p. 15). He gives warning that the preparation of the antigen calls for prolonged cultivations of the pathogenic *entamoeba*, as undiluted alcoholic extracts of the cultures are required as an antigen, and the most careful titration of all the constituents of the test is essential to its success; full details are given. The reactions obtained are sharp-cut and very definite, while weakly positives are seldom seen. No fewer than 623 tests are analysed, all the cases controlled by microscopic and cultural examinations of the subjects—nearly all hospital patients—for *E. histolytica*: 67 (10·7 per cent) gave positive reactions, and in the stools of 61 (91 per cent) the *E. histolytica* was demonstrated. Over 60 per cent showed symptoms that may have been caused by the parasite, and the remainder were healthy carriers who would not have been suspected but for the test. In nearly all those with symptoms treatment resulted in the disappearance of the *amoebæ* from the stools and of the positive blood reaction in all whom it was possible to test. Of 556 negative tests *E. histolytica* were only found in 5, or under 1 per cent. Two of these showed severe amœbic dysentery and liver abscess respectively, and two more had slight amœbic symptoms, while it was noted that the more severe infections usually gave weaker reactions than mild ones. Other intestinal protozoa than the *E. histolytica* were found in 30·3 per cent of the negative reactions. This indicates that they do not give plus reactions with *E. histolytica* antigens, which enhances the value of the test.

L. F. Bishop² records a survey of amœbiasis in New York City, where 60 cases of amœbic dysentery were diagnosed in the Bellevue Hospital in sixteen years, mostly during the wet summer season. P. Manson-Bahr and C. B. V. Tait,³ in a study of 150 cases of amœbic dysentery, emphasize the well-known clinical variations.

A. A. Philipschenko⁴ reports on the incidence of *E. histolytica* infections in Leningrad, where a single examination of the stools of 400 food employees showed this infection in 22·75 per cent, and 47 per cent of these employees suffered from gastro-intestinal disorders. Further, among 225 patients with acute intestinal diseases 40 per cent showed protozoal infections, including 14·2 per cent with *E. histolytica* present; as only a single examination was made the author concludes that 15 to 20 per cent of acute diarrhoea cases are true amœbic dysentery.

TREATMENT.—**Rivanol** (ethoxy-diamino-acridine-lactate) has been tried in the treatment of amœbic dysentery in Egypt by A. G. Biggam,⁵ who found the

preparation to be irritating to the rectal mucous membrane in a concentration of 1-2000, while 1-10,000 had no lethal effect on the *E. histolytica*. Orally even in as high doses as 0.075 grm. thrice daily it had no marked lethal action on that protozoal parasite, but he thinks it had some antispasmodic and antiseptic effect.

H. H. Anderson and C. D. Leake⁶ have investigated the lethal action of **Emetine** compounds in rabbits and cats, and they conclude that in clinical practice it is wise to avoid a larger single dose than 1 mgrm. per kilo. and a total dosage of 10 mgrm. per kilo. As the minimal lethal dose of emetine hydrochloride orally and subcutaneously is about the same, the drug must be well absorbed from the bowel, but it is slowly excreted, so is cumulative. F. J. Leibly⁷ reports the death of a young female of 37 kilo. weight after a total of 1.28 grm. of emetine hydrochloride in about two months, and he points out that emetine in much less than the minimal lethal dose for man is amoebicidal, therefore very small doses with frequent periods of rest should be used; failure to clear up the disease in any particular case is due to the amoebæ being emetine-resistant, when other forms of treatment should be used.

H. W. Acton and N. R. Chopra⁸ record the results of an investigation of the treatment of chronic amoebic dysentery by **Kurchi Bismuthous Iodide**, which they remark could only have been carried out by team-work in such a well-equipped and well-staffed institute as the Calcutta School of Tropical Medicine. Kurchi bark is derived from the *Holarrhena antidysenterica*, which is widespread in all the lower hilly tracts of India, and has long had a reputation in Indian indigenous medicine. R. Knowles in 1928 reported favourably on the use of tabloids of the extract of kurchi bark in amoebic dysentery (see MEDICAL ANNUAL, 1929, p. 16), which he found more effective than its alkaloid, conessine. Chopra found that the total alkaloids of the bark were as powerful against *E. histolytica* as conessine and much easier and cheaper to prepare, and the results of their intramuscular injection were better than those with emetine and less irritating, while they can be given in larger doses. Acton suggested the preparation of a kurchi bismuth iodide, which has been given in doses of from 2 to 4 gr. twice a day, early in the morning and last thing at night on an empty stomach; they were well tolerated, without appreciable effect on the pulse or blood-pressure or irritant action on the bowel. In a series of 18 cases thus treated with 4 gr. twice a day for ten days there were 6 failures, and one or two failures cleared up after 20 gr. a day for ten days. In acute amoebic infections they advise up to nine $\frac{1}{2}$ - to 1-gr. doses of the total kurchi-bark alkaloids, and they report only 1 failure in 10 cases. A table is also given of 10 cases treated by Acton with **Emetine Bismuth Iodide** combined with **Vaccines** made from intestinal streptococci and other organisms, with no failures. A. R. Majumdar⁹ reports on the use of standardized total kurchi-bark alkaloids in amoebic dysentery, with 11 deaths among 34 very chronic debilitated hospital patients. He used 2-gr. doses intramuscularly or a liquid extract orally.

P. H. Jones and R. H. Turner¹⁰ report favourable results from the oral use of **Yatren** in 64 cases in New Orleans, with a satisfactory immediate response in 62, a satisfactory follow-up in 41 cases, and the ultimate reappearance of amoebæ in only 4 (10.3 per cent). No toxic symptoms were noted.

Amoebic Hepatitis and Liver Abscess.—R. N. Chopra and N. De¹¹ report the failure of the alkaloids of *Holarrhena antidysenterica* (kurchi) in the treatment of amoebic hepatitis, although subsequently **Emetine** rapidly cleared up the affection, with reduction in the size of the liver and disappearance of the tenderness. P. W. Brown¹² reports four cases of liver abscess treated at the

Mayo Clinic, and he concludes that **Emetine and Treparsol**, in conjunction with as conservative an operation as possible, preferably **Aspiration** only, is the method of choice in the treatment of this condition.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1929, Sept., 277; ²*Ibid.* 297; ³*Lancet*, 1929, ii, 1028; ⁴*Ann. of Trop. Med. and Parasitol.* 1930, July 8, 165, 177; ⁵*Lancet*, 1930, i, 1335; ⁶*Amer. Jour. Trop. Med.* 1930, July, 249; ⁷*Amer. Jour. Med. Sci.* 1930, June, 834; ⁸*Ind. Med. Gaz.* 1929, Sept., 481; ⁹*Ibid.* 1930, Feb., 80; ¹⁰*Jour. Amer. Med. Assoc.* 1929, July 24, 583; ¹¹*Ind. Med. Gaz.* 1930, July, 391; ¹²*Amer. Jour. Med. Sci.* 1930, Feb., 264.

ANÆMIA IN INFANTS AND CHILDREN: LIVER THERAPY.

Reginald Miller, M.D., F.R.C.P.

It is difficult to find any considerable restatement of the treatment of the anæmias of infants and children since liver therapy has established itself so triumphantly in the treatment of pernicious anæmia in adults, and for this reason a paper published in October, 1930, by A. C. Hampson and E. C. Warner¹ is especially welcome. The chief interest of this communication is found in the section dealing with hæmolytic anæmias and their response to liver therapy.

Hæmolytic Anæmias.—The authors divide the hæmolytic anæmias of infancy and childhood into four groups: (1) True pernicious anæmia; (2) Acholuric jaundice; (3) Hæmolytic anæmia obviously of infective origin; and (4) Congenital, or occurring in the early months of life. In addition to the blood changes, the distinguishing marks of hæmolytic anæmia consist in the staining of the conjunctivæ and skin from the increased blood-pigment in the blood-plasma, the darkening of the urine from the presence of excess of urobilin, and the van den Bergh test giving a negative direct and a positive indirect reaction. Enlargement of the liver and spleen is more constant than in non-hæmolytic anæmias.

1. *Pernicious anæmia* is often stated not to occur in children, but the present authors bring strong evidence to show that rarely a condition quite indistinguishable from the adult disease may be met in childhood: it shows the same blood changes and high index; it is marked by the same hæmolytic crises; and it responds to **Liver Therapy** reinforced by **Blood Transfusions**. The authors lay stress on the very large doses of liver which are necessary to control the hæmolysis in children. These are in comparison far larger than are required in adults, and this need for large doses is probably due to the greater demands on the hæmopoietic system in a growing child. As instances may be quoted a child of 1 year and 8 months who required doses of $\frac{1}{2}$ lb. of fresh liver daily, half this amount producing only a very slow improvement. In another child, age 10 years, $\frac{1}{2}$ lb. only partially controlled the hæmolysis, but $\frac{3}{4}$ lb. did so completely.

2. In *acholuric jaundice*, recognized by its familial tendency and increased fragility of the red cells, **Liver Therapy** may be of value in tiding over critical periods until **Splenectomy** may be performed. It is thus of most use in the youngest subjects of this disease.

3. Hæmolytic anæmias of obviously *infective* origin are in the early months of life usually due to umbilical sepsis or infection of the alimentary tract; more rarely to parasites.

4. *Congenital* hæmolytic anæmia and cases occurring in the early months of life do not as yet form a very clear group. It may be supposed that they are due to an exaggeration of the normal hæmolysis which occurs after the fifth month of fetal life. At first there is in them a true hæmolysis reaching a pathological grade, but later the hæmolysis may cease (though this is not invariable) and the anæmia respond to treatment by **Iron**. The authors do not think that at any stage these cases should be grouped as 'pernicious'. They

are best treated by **Blood Transfusion**, which may lead to dramatic recovery, as in a recent case reported by R. M. Greenthal.²

The value of liver therapy is, in the authors' view, entirely confined to the treatment of hæmolytic anæmias.

Non-hæmolytic Anæmias.—The non-hæmolytic anæmias of infancy and childhood are classified as follows: (1) Anæmia due to hæmorrhage, including hæmophilia and purpura; (2) Chlorotic anæmias secondary to deficiency of dietetic iron, rickets, cœliac disease, and many other disorders; (3) Grave secondary (aplastic) anæmias; (4) Splenic anæmia; (5) Anæmias associated with metabolic disturbances, jaundice, thyroid deficiency, etc.; (6) Anæmias of infective origin—rheumatism, diphtheria, rheumatoid arthritis, syphilis, tuberculosis, etc.; (7) Hodgkin's disease, leukaemia, chloroma, and glandular fever. It will be noticed that the authors do not include von Jaksch's 'anæmia pseudoleukæmia infantum', which, in common with many other authorities, they do not regard as a disease *sui generis*, but hold that the picture of von Jaksch's anæmia may be found in a number of conditions, not necessarily dependent on severity.

Von Jaksch's anæmia is so seldom discussed nowadays in this country that it is interesting to see that the problem of its existence and specificity is still a matter of debate in America. B. R. Whitche³ writes of it, with reports of cases, under the title of "Erythroblastemia of Infants (von Jaksch's Disease)". He regards it as a disease entity, but admits that its causation is quite obscure.

N. K. Gibbs⁴ records the result of an investigation into the blood picture in school-children. She found that the majority of well children showed between 61 and 90 per cent hæmoglobin. The administration of **Iron** led to little improvement amongst debilitated anæmic children, but about half of those who were admitted to an **Open-air School** showed improvement in their hæmoglobin readings.

REFERENCES.—¹*Arch. of Dis. Child.* 1930, v, 299; ²*Amer. Jour. Med. Sci.* 1930, Jan., 66; ³*Ibid.* Feb., 236; ⁴*Lancet*, 1929, ii, 550.

ANÆMIA, PERNICIOUS. (See also above.)

Ivor J. Davies, M.D.

The epoch-making report of Minot and Murphy in 1926 on the treatment of pernicious anæmia by a special diet based on Whipple's experiments has been universally confirmed. The effect of liver treatment reported in contributions from all parts of the world fully endorses the remarkable results claimed for it by the pioneers of the therapy. If treatment is properly carried out and fails to give a response in a few weeks, the case should be carefully reviewed diagnostically. The optimum maintenance dose of liver or liver extract can only be found out by trial, but once ascertained it must be persisted in for the rest of the patient's life. The improvement is often so rapid and striking that there is a tendency to relax liver feeding. The above recommendation of life-long liver treatment cannot be too seriously stressed. The influence of liver treatment on the mortality from pernicious anæmia has been investigated by McKinlay. The hereditary aspect of achlorhydria has been further confirmed by Conner. Castle has continued his experiments on the etiological relationship of achylia gastrica. McAlpine has reviewed the nervous and mental aspects. In a much smaller series of cases of subacute combined degeneration his results of treatment were not as favourable as in those of Ungley and Suzman.

Collier (1920) has made a special study of the morbid anatomy, and his masterly contribution should be consulted so as to obtain a clear conception of the pathology. The disease is one *sui generis*, and peculiar in the fact that there is no neuroglial reaction. The earliest areas of degeneration occur in

the posterior columns, and this fact probably accounts for the striking improvement in Ungley and Suzman's cases, which were mainly in this stage. Paræsthesiæ in adults should always raise a suspicion of the nervous disorder of pernicious anæmia, and if associated with achlorhydria, then liver feeding should be immediately instituted. Further advance in our knowledge of pernicious anæmia is described below.

ETIOLOGY.

W. B. Castle¹ (Boston) has extended his observations on the etiological relationship of achylia gastrica to pernicious anæmia. The preliminary report of this series of contributions was referred to in the *MEDICAL ANNUAL* for 1930 (p. 28). Castle's investigations will probably be shown to be classical, and the present series of experiments should be carefully studied. These experiments clearly demonstrate that the stomach contents of a normal man recovered during the digestion of a meal of beef muscle and subsequently incubated with additional hydrochloric acid contain a substance capable of causing remissions in certain cases of pernicious anæmia comparable to those produced by moderate amounts of liver. It was also shown that beef muscle given directly to these same patients had no effect under the conditions of these experiments. A working hypothesis has been developed which postulates that the development of the disease is dependent upon an inadequate gastric digestion of protein, thus permitting the development of a virtual deficiency in the face of a diet adequate for the normal man. Castle has further examined the validity of his hypotheses by a series of experiments on the effect of the administration to patients with pernicious anæmia of beef muscle after incubation with normal human gastric juice. It was concluded that by some interaction of normal human gastric juice and beef muscle, both of which were shown to be individually ineffective, a substance can be developed which is capable of promptly and markedly relieving the anæmia of certain patients with Addisonian pernicious anæmia. It is believed that the correlation between the production of an effective substance and the presence of a normal proteolytically active gastric juice, in contrast to the demonstrable lack of both in the patient with pernicious anæmia, adds strength to the validity of the original hypothesis of the particular nature of the disease. Castle also believes that for the first time a relationship between the stomach and the function of the bone-marrow of the human being has been demonstrated, and the general belief that the integrity of the stomach is unnecessary to proper body metabolism brought into question. These experiments were most carefully controlled, and are in themselves an admirable illustration of the application of the method of experimental inquiry into the problems of clinical medicine.

W. D. Little, L. G. Zervas, and H. M. Trusler² (Indianapolis) describe a case of chronic obstruction of the small bowel as a result of two entero-enterostomies and apparently the cause of pernicious anæmia. Severe anæmias of primary type have occurred in patients with gastro-intestinal disorders often enough to arouse speculation as to the relationship between the two conditions. Cases have been reported which purport to show that the deranged gastro-intestinal tract is a cause of the disease, although no generally accepted cause for primary anæmia has been agreed on. These observers state that this case strongly supports the belief that primary anæmia may be caused by certain types of prolonged disturbance of the small intestine. The small-bowel abnormality found in this patient as a result of previous operative measures is very rare in surgical experience. The entero-enterostomies were life-saving measures at the time they were performed, but the result argues strongly for a Witzel type

of enterostomy when such an obstruction problem presents itself. Almost all the absorptive area of the small bowel was out of function. It was filled with stagnant fluid contents, and it is fair to presume that absorption of toxic products took place. It is certain, at least, that normal absorption from the most essential absorptive area of the bowel was interfered with. With the exception of free hydrochloric acid in the gastric contents, the laboratory and clinical observations were typical of primary pernicious anæmia. The similarity was further borne out by the typical response of the blood and the clinical improvement, which were both dependent on the daily ingestion of adequate amounts of a potent fraction of **Liver**.

C. C. Ungley³ (Newcastle-upon-Tyne) has made a study of the stomach and pernicious anæmia, inclusive of cases of the so-called subacute combined degeneration of the cord or funicular myelosis. He concludes that the evidence is by no means complete, and any suggestions to be made as to the etiology of pernicious anæmia must necessarily be tentative. From a study of the facts available it would appear that the underlying cause of pernicious anæmia, and of subacute combined degeneration of the cord, is a gastric defect which is usually associated with achylia, most often constitutional and hereditary, but which may be secondary to other conditions, such as chronic gastritis, gastrectomy, etc. The defect results in a failure to break down from ingested proteins a specific substance or substances. The effective principle is present in certain glandular organs, e.g., the liver and kidneys, and probably also the gastric mucous membrane, which possibly act as storehouses. Lack of the specific substance or similar substances is responsible for the abnormal hæmopoiesis, for the changes in the central nervous system, and possibly for the glossitis, gastro-intestinal symptoms, and pyrexia.

H. M. Conner¹ (Rochester, Minn.) has examined the hereditary aspect of achlorhydria in pernicious anæmia by a study of 154 relatives of 109 patients at the Mayo Clinic. From the figures it seems to be strongly indicated that, when correction is made for age and sex, achlorhydria has a distinct tendency to occur more frequently among blood relatives of patients who have pernicious anæmia than among normal persons or those who have a great variety of other diseases. This may mean that there is an inherited tendency to the occurrence of achlorhydria in many blood relatives of patients with pernicious anæmia over and above any such tendency among patients having various other diseases, and even among those having gastro-intestinal symptoms. It seems unlikely, however, that the achlorhydria itself is inherited, but that the tendency to its development later may be an inherited factor. This is shown by the incidence of 15·7 per cent of achlorhydria among those relatives under 40 years, and by the incidence of 42·3 per cent among those over 40 years. If the achlorhydria, as such, is inherited directly, the incidence should differ little in the two age groups. Although it cannot be stated that these results prove an hereditary aspect of pernicious anæmia, they strongly suggest a familial tendency to the development of one of its most important features.

DIAGNOSIS.

F. C. Eve⁵ (Hull) described the early diagnosis of pernicious anæmia by the *halometer*, an instrument which enables the practitioner to measure the average size of the red cells quickly and easily, and thus to make an early diagnosis of pernicious anæmia and allied conditions in a stage termed pre-pernicious anæmia. The instrument is obtainable from Messrs. Down Bros., or Allen & Hanburys, London. A thin blood-smear acts as a very efficient diffraction grating and splits up the rays from a small source of light into a

brightly coloured halo like a circular rainbow. The smaller the particles the larger the halo, and vice versa, so that the large red cells characteristic of pernicious anæmia produce a halo which is smaller than the normal.

TREATMENT.

Liver Treatment.—

Influence on Mortality.—P. L. McKinlay⁶ (London) has examined the influence of liver treatment on the mortality from pernicious anæmia, and draws the following conclusions. The inferences suggested by the analysis of the mortality returns of pernicious anæmia in England and Wales may be thus summarized. For the six years immediately preceding the introduction of the new dietetic treatment of this disease the rates of mortality in both sexes pursued a course which was practically horizontal, the age and sex distributions of the deaths at the same time showing no important changes. In 1927 there was a slight tendency towards improvement apparent in males, and specially affecting the returns of the last three months of the year; but, taken in conjunction with the findings for the mortality among females, it may fairly be said that the evidence of significant change which can be derived from these statistics is not at all convincing. In the succeeding year a very definite decline in mortality took place—a reduction of some 915 deaths over expectancy, affecting both sexes, limited chiefly to young adult and middle ages, beginning early in the year and consistently increasing towards its close; greater in London than elsewhere, and occurring in the absence, so far as we are at present aware, of change in any factor liable to affect the course of mortality other than the method of treatment. The general inference seems obvious. That there has been a definite lag between the institution of the new treatment and the response of the death-rate is not at all surprising. The whole of the evidence is consistent with the view of causal association between the two factors, and, judging from the course of mortality in the comparatively short period since the institution of specific therapy, it would seem safe to predict that extension of the treatment to a still larger proportion of patients suffering from the disease will be reflected in further decline in the mortality attributed to this cause.

Critical Summary.—Janet M. Vaughan⁷ (London), in a critical review of the liver treatment of anæmias, draws the following conclusions: (1) Liver is a certain remedy in those forms of anæmia characterized by megaloblastic hyperplasia of the bone-marrow, i.e. (a) pernicious anæmia, (b) sprue, (c) the pernicious anæmia of pregnancy. (2) The therapeutic action of liver is seriously inhibited by the presence of sepsis. (3) Liver is of definite value in some cases of anæmia secondary to gastric hæmorrhage and in the nutritional anæmias. (4) Liver appears without value in other forms of anæmia. (5) The action of liver is dependent upon at least two distinct factors: (a) its inorganic salt content, (b) the complex polypeptide isolated by Cohn, Minot, Allies, and Salter, one or both of which may be effective in varying conditions. (6) Pernicious anæmia must be recognized as a deficiency disease. In the absence of some principle present in liver and kidney the bone-marrow is unable to produce its normal quota of red cells, and anæmia therefore ensues. This substance is probably lacking, though from other causes, in sprue and the anæmia of pregnancy. (7) The severe nervous lesions of subacute combined degeneration of the cord may improve considerably long after a normal blood picture has been achieved if treatment is continued. (8) In patients suffering from pernicious anæmia sudden improvement in mental outlook and a rapid gain in weight are characteristic, and as important a sign of a satisfactory response to liver treatment as a rise in the reticulocyte count. (9) The

leucopenia of pernicious anæmia is not invariably lost as a result of liver treatment. (10) The claim that an eosinophilia is characteristic of the response to liver appears to be without satisfactory foundation.

This extensive review includes 630 cases of pernicious anæmia, of which full details were available in 375 instances. For the purposes of the discussion the anæmias were divided into: (1) Pernicious anæmia; (2) Anæmia associated with pregnancy or sprue and closely simulating pernicious anæmia; (3) Anæmia secondary to hæmorrhage; (4) All ill-defined groups of anæmias secondary to other conditions such as leukæmia or cancer of unknown origin.

Eosinophilia.—E. Meulengracht and S. Holm⁸ (Copenhagen) have investigated the question of eosinophilia in liver diet. Various contributors have found a marked eosinophilia in patients on liver treatment, and some believe it to be part of the patient's reaction and of prognostic significance. The following conclusions are drawn from this paper. Eosinophilia in liver treatment of pernicious anæmia has appeared in a marked and persistent form when the treatment is carried out with raw liver (calf) in large doses. As a rule, the eosinophilia has appeared rather suddenly after about four weeks of treatment, and it has reached to high degrees—20, 40, even 74 per cent. It seems to persist as long as the administration of raw liver is kept up. On treatment with fried liver (calf) or liver extract, the phenomenon has usually been absent; and when present in single instances, it was in a faint and transitory form. Control individuals suffering from various other diseases have responded to the treatment in the same manner as have patients with pernicious anæmia, as they constantly showed eosinophilia on ingestion of raw liver, but not after intake of fried liver or liver extract. This eosinophilia is to be considered a by-product in the treatment of pernicious anæmia with raw liver that has nothing to do with the curative effect of the treatment. As far as is directly observable, the eosinophilia represents a harmless phenomenon.

Reticulocytosis.—W. B. Porter and H. Irving⁹ (Richmond, Va.) have studied the response of patients with pernicious anæmia to an aqueous extract of liver, making two-, three-, and four-hour-interval observations. These observations suggest that, if a liver fraction is potent and is administered in adequate amounts, the maximum number of reticulocytes in the circulating blood may be present for a brief period. The total number of reticulocytes released in a given case is dependent on the volume of hyperplastic bone-marrow; however, the percentage of reticulocytes may vary widely, dependent on the frequency of observations. Obviously this is a factor of major importance if one is to use the percentage of reticulocytes as an index to potency and in establishing therapeutic dosage.

Aqueous Extract of Liver.—W. B. Porter, J. P. Williams, J. C. Forbes, and H. Irving¹⁰ in 1929 reported on the production of a stable aqueous extract of liver. An aqueous extract made according to their formula has been used successfully by H. M. Conner¹¹ at the Mayo Clinic in the treatment of twenty patients suffering from pernicious anæmia. The effect on reticulated erythrocytes, mature erythrocytes, and hæmoglobin was essentially the same as that obtained with the liver diet or with Minot and Cohn's extract of liver. The effect on the symptoms was similar to that obtained by the other measures.

'Abortive Relapses.'—R. Isaacs¹² (Ann Arbor, Mich.) states that in pernicious anæmia some of the symptoms of a relapse may occur even though a complete blood remission is maintained with liver treatment. 'Abortive relapses' are indicated by loss of appetite, exacerbation of symptoms, or the appearance of new symptoms, when the blood is normal or shows no corresponding change. Liver therapy is often discontinued because of the loss of appetite (gastro-intestinal or nervous relapse), and a hæmopoietic relapse follows. If the liver

therapy is maintained, the 'abortive relapse' may pass into a remission. A study of the author's case reports shows the importance of continuous liver treatment, and, if loss of appetite and disinclination for liver occur, the latter should be presented in another form. Difficulty may be overcome by variety in preparation. A reliable extract is essential; in one of Isaacs's cases it was found that an ineffective extract had been used.

Failure of Liver Therapy.—The *Lancet* (1929, ii, 935), in an annotation on a paper by P. Emil-Weil,¹³ raised the question: "Are there any cases of pernicious anæmia which will not respond to liver?" Pointing out that we have at present three criteria of pernicious anæmia—namely, achlorhydria, hæmolysis, and an increase in the mean size of the red cells—the annotation says that, as Emil-Weil gives no information on the last two points, "it would be rash to amend the aphorism that anæmia which will not respond to liver is not pernicious anæmia." A. C. Hampson (London)¹⁴ reports a case which has been under continuous observation for over two and a half years and which showed all the criteria mentioned, yet has not reacted to liver treatment, though very large doses were given.

A. H. Holmes¹⁵ (Swansea) reports three cases of Addison's anæmia which failed to respond to treatment by liver; the diagnosis in two cases was confirmed by post-mortem examination. Two of Fraser's series failed in a similar manner, and G. Guiani, of Genoa, found that 15 per cent of his cases did not answer to liver therapy, but possibly many of his cases were moribund when they came under treatment, and their bone-marrow was thus unable to respond. Holmes suggests that in some cases the exciting cause is so powerful that it overcomes any benefit that might be expected to accrue from the administration of liver.

Auxiliary Use of Insulin.—L. von Varga¹⁶ (Szeged) believes that, whilst a liver diet must be regarded as the standard remedy for pernicious anæmia, **Insulin** may be looked on as an indispensable auxiliary, and administered to combat the well-known loss of appetite in the disease. The anorexia and cachexia of his patients made it impossible to begin a liver diet at once. The results were satisfactory, and in one case the preliminary use of insulin was of vital importance. Treatment began with 20 to 30 units (twice daily), increasing with improvement in appetite to 40 units, always half an hour before meals.

Treatment with Certain Preparations of Stomach.—J. F. Wilkinson¹⁷ (Manchester) submits a preliminary report on this subject. Achlorhydria is present in practically every case of pernicious anæmia. Achylia gastrica is also a constant accompaniment of the affection, and is regarded by Strauss as a part of the underlying bodily changes predisposing to the disease. Wilkinson's communication is a summary of the results obtained in a preliminary series of nine cases of pernicious anæmia. These were divided into three groups, which were treated respectively with: (1) Normal gastric juice; (2) Raw fresh mucous membrane or muscular layer of hogs' stomachs; and (3) Desiccated preparations from these two portions of the stomach of the hog. The results were controlled by daily reticuloocyte counts, frequent regular full blood examinations, and the clinical conditions of the patients both before and after discharge from hospital. Cases of pernicious anæmia in various stages of the disease were examined, and the final results obtained in all cases were at least equal to, whilst the immediate clinical results appear to be distinctly better than, those obtained in corresponding cases on a fresh liver diet. The original paper must be consulted for the method of preparation and mode of administration of the desiccated preparation of the hog's stomach.

A. Renshaw¹⁸ (Manchester) reports a case of pernicious anæmia successfully

treated with desiccated hog's stomach (ventriculin) whilst in a severe relapse despite treatment with liver.

C. C. Sturgis and R. Isaacs¹⁹ (Ann Arbor, Mich.) confirm Castle's observations, and found that whole desiccated hog stomach and hog stomach defatted with petroleum benzine produce a satisfactory hæmatopoietic remission in pernicious anæmia.

Blood Transfusion.—A. Goodall and A. M. Calder²⁰ (Edinburgh) record cases illustrating the importance of transfusion and, if necessary, of repeated transfusion in the severest examples of pernicious anæmia. Progress in pernicious anæmia under liver therapy is often interrupted when the hæmoglobin percentage is in the neighbourhood of 60. This interruption may be tedious, but can be overcome by massive doses of liver and liver extract. It is important that only liver extracts of known activity should be used.

SPECIAL ASPECTS.

Nervous and Mental Changes.—D. McAlpine²¹ (London) has reviewed the nervous and mental aspects of pernicious anæmia, and his main conclusions are as follows: The neurotoxin associated with pernicious anæmia may attack all parts of the nervous system, cerebrum, spinal cord, and peripheral nerves, although not necessarily simultaneously. Mental changes occur not uncommonly in pernicious anæmia. They range from states of depression, accompanied by loss of mental energy, to definite psychoses. They, like the nervous symptoms, may precede the characteristic changes in the blood by many months. More frequent examination of the gastric contents and of the blood, especially for the presence of megalocytosis, is called for in primary neuroses, and psychoses occurring after the age of 35, in view of the favourable results that may follow adequate treatment instituted at an early stage. The effects of liver treatment on the neurological symptoms are variable. In cases showing a marked degree of anæmia the improvement may be largely attributed to the favourable effect of such treatment on the blood and general condition. When an extensor response exists this improvement is slight; the progress of the disease may for a time be arrested, but not uncommonly it advances despite adequate treatment. McAlpine's results were not as favourable as those of the large series of cases of subacute combined degeneration described by Ungley and Suzman and referred to in the *MEDICAL ANNUAL* for 1930 (p. 486).

Pernicious Anæmia of Pregnancy.—R. Peterson, H. Field, and H. S. Morgan²² (Ann Arbor, Mich.) report three cases of the pernicious or hæmolytic anæmia of pregnancy which had been treated with a high liver diet or liver extract. Although the situation was complicated by transfusions in two cases, the response to liver treatment seems to have been quite analogous to that obtained by such treatment in primary pernicious anæmia. One patient was relieved by the treatment, but did not become well until after the termination of pregnancy. In all these cases free hydrochloric acid was demonstrated in the gastric contents. P. Esch²³ and R. C. Larrabee²⁴ (quoted) describe two distinct types of anæmia in association with pregnancy. In some there is a low colour index and the blood picture of a secondary anæmia. These cases have a good prognosis. The majority of reported cases afford justification for the names given to the condition by their close resemblance to primary pernicious anæmia, and seem to form a distinct group. The anæmia is severe, often fatal. The colour index is high; there is a high-grade poikilocytosis and anisocytosis with megalocytes and frequently megaloblasts. The blood bilirubin is increased. An important distinction between these cases and those of primary pernicious anæmia is the fact that there is not necessarily an

associated achlorhydria. **Liver Extract** is preferable to raw liver in view of the possible danger associated with high liver feeding during pregnancy when there is a tendency to nephritis or toxæmia. Careful observation of the urine and blood-pressure is necessary.

C. E. Galloway²⁵ (Chicago) has studied a large series of cases of the anæmia of pregnancy, and concludes: (1) The majority of women, when pregnant, develop anæmia; (2) The anæmia grows worse as pregnancy advances; (3) The anæmia of pregnancy will respond to proper treatment in the majority of cases; (4) Examinations and treatment for anæmia should be included in the routine care of pregnant women; (5) Since certain patients showing severe anæmia near term have a tendency to hæmorrhage, since little is known about the origin of pernicious anæmia of pregnancy, and since it has been reported that the anæmia responds to transfusion, the blood of these patients with severe anæmia should be typed and matched for **Transfusion of Whole Blood**.

Relation of Cholesterol, Lecithin Phosphorus, and Fatty Acids to the Remission of Pernicious Anæmia.—G. L. Muller²⁶ (Boston) has carried out investigations on this subject. The findings in his series of cases of pernicious anæmia show that the cholesterol in the blood plasma is low in relapse, but that a sudden rise to a higher level, which later increases and is maintained, occurs at the onset of the remission. The increase of the cholesterol, as a rule, is concomitant with the reticulocyte response and apparently proportional to the intensity of this reaction. The increase of the cholesterol is not dependent upon whether the active principle effective in pernicious anæmia is fed in one form or another, nor upon the number of red blood-cells in the peripheral blood, but upon the change that takes place in the organism at the onset of a remission. It is, however, proportional to the amount fed of the active principle effective in pernicious anæmia. Suboptimal doses call forth an irregular response of the cholesterol, while optimal doses increase and maintain the cholesterol at a normal or high level. As in the case of the reticulocytes, the response of the cholesterol is of greater magnitude the lower the red-blood-cell count. After the remission has commenced, a change from liver extract to liver, kidney, or meat, partially digested with gastric juice, which contains a considerable amount of cholesterol, does not influence the level of cholesterol except when the remission has been weak because of inadequate dosage and the cholesterol level has been fluctuating within wide limits. In such cases the administration of adequate doses of the effective principle caused the level to become steady at normal figures. An incomplete response of the reticulocytes without actual improvement in the patient calls forth a slight increase in the cholesterol temporarily, with a subsequent fall to the previous level. Infection, delaying or giving an irregular response to treatment, like inadequate dosage, is reflected in an irregular cholesterol and lecithin-phosphorus curve with wide fluctuations. The lecithin phosphorus as a rule follows the cholesterol, although exceptions occur. Occasionally normal values of lecithin are found with subnormal values of cholesterol, or the lecithin phosphorus may rise somewhat more slowly. The fatty acids do not show any significant variation during remission, the same fluctuations around a normal level being obtained before and after the onset of remission.

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¹⁷*Brit. Med. Jour.* 1930, i, 256; ¹⁸*Ibid.* 334; ¹⁹*Jour. Amer. Med. Assoc.* 1929, Sept. 7, 747; ²⁰*Lancet*, 1929, ii, 1144; ²¹*Ibid.* 643; ²²*Jour. Amer. Med. Assoc.* 1930, March 22, 839; ²³*Zentralb. f. Gynäkol.* 1926, April 13, 857; ²⁴*Amer. Jour. Med. Sci.* 1926, Sept., 371; ²⁵*Jour. Amer. Med. Assoc.* 1929, Nov. 30, 1695; ²⁶*Amer. Jour. Med. Sci.* 1930, March, 316.

ANÆMIA, SECONDARY.

Ivor J. Davies, M.D.

Classification of Chronic Idiopathic Secondary Anæmia.—C. H. Watkins¹ (Mayo Clinic) divides the so-called idiopathic types of secondary anæmia into four general groups according to the morphology of the blood:—

1. The first type usually occurs in young persons, and mainly in females; the hæmoglobin is moderately reduced, whilst the red cells are only slightly reduced. Rapid improvement follows the use of a well-balanced **Diet, Iron,** and **Fresh Air.**

2. This type is characterized by a proportionate reduction of hæmoglobin and erythrocytes, and appears to be due to a dysfunction of the bone-marrow. Treatment consists in stimulation of the bone-marrow and the use of **Iron.**

3. The third type occurs chiefly in women between 30 and 50, and as a rule is of long standing. The hæmoglobin is reduced to as much as 50 per cent, whereas the red-cell count remains relatively high. Achlorhydria may be associated, and the condition has often been considered to be an early stage of pernicious anæmia, although many of these cases do not develop into this disease. A powder made from fetal **Liver** of calves was found to be effective.

4. The fourth type was found only in young persons whose near relatives have had pernicious anæmia. The erythrocyte count is slightly reduced and the hæmoglobin to a moderate extent, so that the colour index is less than 1. The neutrophil of pernicious anæmia is present, and the type is called the 'potential pernicious anæmia type'. A good response was obtained from small amounts of **Raw Liver** or **Liver Extract.**

A large series of cases was studied, and the classification is presented as a provisional one for the present. It is evident that a very careful examination of the morphology of the blood is necessary in all cases of secondary anæmia.

Mechanism of Secondary Anæmia.—A. H. Douglas and H. Tannenbaum² (New York) have studied this subject, and come to the following conclusions: (1) Cases of anæmia may be grouped etiologically if the reticulocyte count and the icteric index are known. They may be classified as due to: (a) Hæmorrhage; (b) Diminished production of blood, or faulty delivery of the red cells into the circulating blood; (c) Destruction of blood; or (d) Combinations of these factors. (2) In twenty cases of secondary anæmia without hæmorrhage the reticulocyte counts were normal, and the icteric indices normal or low. (3) The common form of secondary anæmia found in such chronic conditions as nephritis or abscess of the lung and in some of the acute infections (particularly acute rheumatic fever) is the result of the diminished production of blood.

Blood Regeneration in Severe Anæmia.—G. H. Whipple, F. S. Robscheit-Robbins, and G. B. Walden,³ in a further series of experiments on blood regeneration in severe anæmia, describe a liver fraction which contains 65 to 75 per cent of the potency of whole liver for new hæmoglobin production in experimental anæmia due to hæmorrhage. This fraction represents 3 per cent of the weight of the whole liver. Probably a number of active substances are represented in this liver fraction. Inorganic substances are important. Supplementing this liver fraction with iron may increase the total output of hæmoglobin. The same thing is true for whole-liver feeding plus iron, which may give maximal hæmoglobin production in experimental anæmia. Supplementing this liver fraction with small amounts of whole liver may increase the

total output of new hæmoglobin above the level due to liver fraction alone. These experimental observations will be of greater interest when compared with similar controlled observations in various human secondary anæmias. This liver fraction is palatable and can be taken in considerable amounts without clinical disturbance. Reasons are given why liver therapy is so spectacular in pernicious anæmia and nobably less effective in certain secondary anæmias. The authors urge that **Liver Therapy** should not be considered inert in any type of secondary anæmia until it has been given a thorough test. All evidence available points to liver and kidney as supplying the essential factors in the most accessible form for the reconstruction of new hæmoglobin and red cells in anæmia.

Simple Achlorhydic Anæmia.—A careful study by L. J. Witts⁴ (London) may be summarized as follows: (1) Achlorhydia may be associated with a primary or with a secondary type of anæmia. The primary type is Addison's anæmia, the secondary is here described as simple achlorhydic anæmia. (2) Simple achlorhydic anæmia is a common disease. It occurs most frequently in middle-aged women. The cardinal symptom is achlorhydia, which may be hereditary or acquired. Glossitis and slight splenomegaly may also occur. (3) The achlorhydia is a primary etiological factor in the disease. It is found before the development of the anæmia, and persists when the anæmia is cured. (4) The anæmia is of the secondary or chlorotic type. There is no sign of increased hæmolytic. The white cells and platelets are unaffected. The bone-marrow is hyperplastic owing to increase of the erythroblastic tissue. The spleen may show a pure hypertrophy. No other post-mortem changes are found. (5) Treatment is by **Transfusion** or by large doses of **Iron**. The effective dose of iron is twice the maximum pharmacopœial dose. Liver and hydrochloric acid have no effect on the anæmia. Continuous treatment is necessary to prevent relapse. (6) The relations between simple achlorhydic anæmia and Addison's anæmia are discussed. They are closely connected in pathology and in familial incidence. Each is usually clearly characterized and differentiated, but occasional transitional forms occur. (7) The relations between simple achlorhydic anæmia and the Plummer-Vinson syndrome of dysphagia and anæmia are also discussed, and it is concluded that they are closely allied diseases.

Acute Hæmolytic Anæmia.—M. Lederer⁵ (Brooklyn) in 1925 reported three cases of rapidly developing anæmia of a hitherto undescribed type and termed acute hæmolytic (infectious) anæmia. He now describes three additional cases.⁶ In general, a very profound anæmia, rapidly progressive, marked leucocytosis (a modified leukæmoid picture), and an erythroblastæmia dominated the blood picture. No exciting cause was determined. References to two other cases in the literature are included. Six cases recovered permanently after **Transfusion** of unmodified blood, one after transfusion with citrated blood, and one without transfusion.

Anæmia of Undernutrition.—C. S. Keefer and C. S. Yang⁷ (Peiping) report a group of cases in which malnutrition was the cause of a severe anæmia. In some an inadequate diet was responsible, and in others a pathological process which interfered with normal nutrition was present to account for the malnutrition and anæmia. That these anæmias were due to inadequate nutrition was supported by the fact that all showed signs of malnutrition, some had specific deficiency defects in the form of avitaminosis, and all showed improvement following adequate diets, with the exception of the cases which were complicated by severe infections. The regeneration of hæmoglobin could be accelerated by supplementing the usual hospital diet with **Liver** and **Iron**, and in some cases with liver extract and iron. These cases also demonstrated

that the whole liver and iron was more effective in accelerating hæmoglobin regeneration in some anæmias than when either substance was given alone. Whole liver and iron was found to be more beneficial than liver extract and iron. Liver extract was beneficial in some of the anæmias of childhood.

Liver Therapy in Anæmia of Alimentary Origin.—D. T. Davies⁸ (London) has studied the effect of liver therapy in anæmia of alimentary origin as shown in four cases of carcinoma of the stomach and one probable case of carcinoma of the pancreas. From a study of the literature and the foregoing cases the response of certain types of anæmia of gastric origin to liver therapy seems to be comparable to that of the primary anæmia. Two conclusions naturally follow from this: (1) Improvement through liver therapy in cases of anæmia associated with achlorhydria is not diagnostic of pernicious anæmia; and (2) Liver therapy may prove of therapeutic value in gastric conditions, in pre- and post-operative periods, in which there is an anæmia associated with an achlorhydria, although the blood-count be not of the pernicious or primary type.

Treatment of Idiopathic Anæmia with Iron and Copper.—E. S. Mills⁹ (Montreal) describes the treatment of idiopathic (hypochromic) anæmia with iron and copper. He investigated a group of cases of secondary anæmia which had proved resistant to liver feeding and to ordinary iron therapy. Such cases have been referred to recently in the literature under the rather paradoxical title of 'idiopathic secondary anæmia'. In his experience the disease invariably begins in women between the ages of 20 and 40. The blood shows little or no reduction in the red cells, but they are smaller than normal, and the striking feature is their pallor—hence the extremely low colour index. There is usually, though not invariably, achlorhydria. They differ from Addisonian anæmia in that (1) achlorhydria is not a constant feature, and (2) they do not show the blood picture or the cord changes of the disease. Cases of this disease of long duration were treated with a combination of **Iron and Copper** given in capsules by mouth. Prompt improvement followed in all cases, with restoration of the blood to about its normal level. The capsules contained Bland's mass 2 grm., copper sulphate 1.5 mgrm., and a little cascara, and three capsules were prescribed daily. It is evident that Mills's cases of idiopathic (hypochromic) anæmia closely resemble those described by Wits under the title of 'simple achlorhydric anæmia' (see p. 28). The only important difference is that Mills states that no cord changes occur, but a complaint of numbness or tingling in the extremities is included in his general description of symptoms. Wits, on the other hand, states that "changes of a nervous character, such as paræsthesiæ, apparently due to affection of the posterior columns of the cord, also occur". This difference may thus be only one of interpretation of such minor nervous disorders, and such symptoms are of course common in any form of severe anæmia.

Response of Reticulocytes following Various Forms of Treatment.—C. S. Yang and C. S. Keefer¹⁰ (Peiping), in a study of fifty-three cases of secondary anæmia, showed that the response of the reticulocytes depends on the severity and the cause of the anæmia, and the form of treatment employed during recovery. The highest reticulocyte counts were observed in malaria, anæmia due to hookworm, and the anæmias associated with dysentery, undernutrition, and pregnancy. In the last four conditions nutritional disturbances seemed to play a part in the production of anæmia, and when the patients with these conditions were treated with **Liver or Liver and Iron, or Cod-Liver Oil** and a **High Caloric Diet**, anæmia decreased and the percentage of reticulocytes increased. In many of the cases of secondary anæmia the results produced in the reticulocyte count by the forms of treatment mentioned were as striking as those seen

in pernicious anæmia following treatment with liver or liver extract. It would appear, therefore, that feeding of liver as a method of treatment in anæmia is not specific for pernicious anæmia, but has a beneficial effect in many forms of secondary anæmia. In many instances **Liver and Iron** together were more effective than liver or iron alone.

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ANÆSTHESIA. (See also ABDOMINAL SURGERY, MISCELLANEOUS.)

J. Blomfield, O.B.E., M.D.

Spinal Analgesia.—The past year has witnessed progress in the practice of spinal injection and in the knowledge of its physiological working that is likely to lead to a great extension of this method in the near future. Important work has been published, notably by H. Koster^{1, 2} in America and by Howard Jones³ and C. Donald⁴ in this country. The fear of bulbar paralysis by upward extension of the injected drug has been shown to be groundless if the agents are confined to those of the novocain class—i.e., stovaine is not devoid of this danger. It looks, indeed, as though stovaine, except in small doses for operations on the lower extremities or pelvis, were likely to be entirely abandoned in the future; it is undoubtedly a more dangerous drug than the others in common use for spinal analgesia. It has, of course, the corresponding advantage of being a more powerful paralyser of the voluntary muscles. H. Koster and L. P. Kasman¹ carried out a number of experiments to prove the safety of allowing diffusion of the injected **Novocain** even to the medulla and brainstem, and they have acted clinically on the knowledge thus obtained. In animals they have applied pads soaked in novocain solution directly to the cord and medulla. By this means they have obtained complete anæsthesia of the entire body, yet there was no change in the respiratory movements, nor was there any dyspnoea. They write: "If paralysis of respiration results from the diffusion of the drug from the lower portion of the spinal subarachnoid space where it is injected (i.e., at the level of the second lumbar vertebra) to the medulla, the same effect, namely, paralysis, should be produced more quickly, readily, and easily by the direct application of the anæsthetic agent to the medulla. By such direct application there would not be any loss occasioned by diffusion; nor would there be a diminution in the concentration of the anæsthetic solution. The maximal effect, if the anæsthetic causes depression, should therefore be obtained. . . . Direct application of concentrated solution to the medulla, the relative anæsthetic content of which was proportionately far greater than that in the human, did not result in any such respiratory depression or paralysis. It seems paradoxical that anæsthesia can be produced by the action of an anæsthetic agent on sensory fibres without producing an effect on such a delicate mechanism as the respiratory centre. . . . The anæsthetic agent had a selective affinity for sensory nerve tissue . . . it is not so difficult to understand how an anæsthetic solution which diffuses up to the medulla, or at least up to the level of origin of the phrenic nerve, namely the third, fourth, and fifth cervical roots, could cause ablation of sensory conduction or could anæsthetize the sensory fibres without any effect whatever on the motor fibres contained in the nerve or in the nerve tissue."

There are other confirmatory examples of the difference between sensory and motor elements in their reaction to drugs, e.g., the action of cocaine on sensory and that of curare on motor nerve-endings. Respiratory movements initiated

by a purely automatic motor centre may be maintained despite the existence of such a degree of poisoning by an anæsthetic as has brought about an interruption of conductivity in sensory fibres. "It is this property of selectivity (dependent on inherent differences in nerve fibres, endings, and cells) which is so important a factor in the explanation of the phenomenon of surgical anæsthesia of the entire body without respiratory paralysis. Those who employ solutions heavier or lighter than cerebrospinal fluid in order to limit the height of anæsthesia below the level of the medulla by controlling the degree of diffusion need no longer worry. Experimental and clinical evidence have clearly demonstrated that even were the solution to diffuse, as they fear it might, a fatal termination due to respiratory paralysis would not follow." Anæsthetic substances in solution are very rapidly fixed by the nerve tissues with which they come into contact. Therefore the patient's position after a very little time makes no difference so far as diffusion is concerned. Another reason for safety with high spinal effects depends on the physiological fact that conductivity in nerve tissue is interrupted before excitability is abolished. "Thus sensory impulses *en route* to the cerebrum may be stopped in the medulla because conductivity is interrupted, whereas the cardiac and respiratory centres, although their excitability is lowered, can still initiate motor impulses in response to the physicochemical stimuli furnished by the blood. This factor and the selective affinity of the cocaine group anæsthetics for sensory fibres explain the possibility of complete anæsthesia of the entire body without respiratory or cardiac failure."

Fortified by their experimental work, Koster and Kasman have used spinal anæsthesia for operations on pretty well every part of the body. For the average operation below the diaphragm they found $\frac{1}{16}$ grm. of **Neocaine** dissolved in about 4 c.c. of cerebrospinal fluid a sufficient dose. If anæsthesia of head and thorax is desired, 250 mgrm. of neocaine dissolved in 8 c.c. of cerebrospinal fluid are injected between the 2nd and 3rd lumbar vertebrae. The dosage is reduced for young children. In head anæsthesia the authors find absence of complete motor paralysis of the upper extremities and head, and have found this feature valuable during operations for repair of lacerated tendons of the hand or fingers. Referring to the fall in blood-pressure which is usually regarded as the most obnoxious symptom of spinal analgesia, the authors state that in more than 250 cases out of 4500 the fall was so great that the pressure could not be read on the manometer. They have learned, however, that so long as the Trendelenburg position is maintained no steps need be taken to counteract the fall in blood-pressure; recovery always follows. The physiology of the phenomenon is fully explained in the article, and consists briefly in splanchnic vascular dilatation and the prevention of cerebral anæmia by the head-down position. The only vasomotor stimulants regarded as being of any use are those which act directly on the blood-vessels. For the headache which is common after spinal analgesia the authors recommend 6 oz. of 50 per cent solution of **Magnesium Sulphate** as an enema four-hourly.

These views and the practice resulting from them are a contradiction to much that was advanced by Pitkin for **Spinocain**. The solution that he advocates is useful in practice, but most of his claims are unsubstantiated. They were carefully investigated by C. Donald,⁴ who found, for example, that Pitkin's 'light solution' is only so while outside the canal, not when introduced. He found, too, that spinocain is not controllable as maintained, any more than novocain or neocaine; but, as Koster has shown, Donald thinks that controllability does not matter. He does not find either that absolute maintenance of blood-pressure claimed by Pitkin for his technique. With regard to **Ephedrine**, Donald thinks that it has little effect on blood-pressure during operation, but

causes a quicker restitution to normal when recovery from a fall of pressure is taking place.

The work of Howard Jones³ on **Percaine** demonstrates a wide field for spinal analgesia on a rather different basis. To begin with, percaine is nothing to do with the cocaine series of drugs, but is a derivative of quinoline and therefore related to quinine. Redistilled water is used for preparing the solution, which may be repeatedly boiled without decomposition, but cannot bear contact with any alkali. Dilute **Hydrochloric Acid** (5 min. to each litre of solution) is therefore added to counteract any possible alkalinity from glass containers. The maximum amount of the drug injected is 0.004 grm. per kilo. of body weight. The great merit of percaine is the extreme dilution in which it is effective, making it a safe drug to use, although it is ten times as strong as cocaine in laboratory tests; also the analgesia it produces is remarkably durable. Extensive infiltrations have produced no toxic effects, showing its freedom from local irritating properties. Howard Jones has used it principally in spinal work, but others have borne testimony to its value as a local analgesic agent.⁵ Jones gives a masterly account of the physics of spinal injection, and his conclusions support those arrived at by Koster² as well as demonstrate the reason for some failures with spinal injection, viz., the fact that the effect may be produced more on the anterior than the posterior roots if a solution is injected really lighter than the cerebrospinal fluid and the patient is lying on his back. The result will be good motor paralysis but deficient abolition of sensibility to pain, a phenomenon which has been met by and has puzzled anæsthetists. The method which Howard Jones advocates, and uses with success, is to "treat the subarachnoid space in the same manner as the tissues, and, without withdrawing any cerebrospinal fluid, injecting under pressure a large quantity of analgesic solution to the limit required by the operation." He reports results in over 100 cases. With a maximum of 20 c.c. of 1-1000 percaine he gets splanchnic block, the anæsthetic reaching the roots of the 2nd or 3rd dorsal nerve. The solution (1-1000) appears to remain unchanged in ampoules from which it may be used direct. The injection is made between the 1st and 2nd lumbar vertebræ. The duration of analgesia is proportional to the concentration of percaine. For an hour or more 1-1500, and up to two hours 1-1000, are the strengths required. Puncture is made in the right lateral position, only a few drops of cerebrospinal fluid are allowed to escape, and injection is then begun. When resistance to the in-going solution is felt, a pause is made to allow the fluid to push upward, and a pause between each 2 c.c. of injection is recommended. After withdrawal of the needle the patient is turned flat on his face for five minutes in order to soak the posterior roots. When the patient is put on his back analgesia may have developed, but not muscular paralysis, which, however, soon follows when the solution reaches the anterior roots. The fall of blood-pressure which occurs is not nearly so severe as it is with large doses of novocain or stovaine. This is because the high dilution of the percaine makes sudden absorption of a toxic amount impossible.

During manipulation of the stomach in an operation on the upper abdomen vomiting is unavoidable, since it probably results from vagal reflexes and neither the vagus nor the phrenic is blocked. The author recommends that in a hot theatre a stream of air be directed from a motor pump so that the air around the patient's face is kept moving, and an occasional sponging of the face with cold water is welcomed. If respiration tends to fail, it is due to paralysis of the intercostals. The application of 3 per cent **CO₂** in **Oxygen** supplies adequate respiratory stimulation to overcome the deficiency.

The successful use of an injection of 2 c.c. of spinocaine into the 2nd lumbar interspace for *paralytic ileus* is recorded by J. T. Spencer.⁶

A study of the spinal fluid following injections for spinal anaesthesia⁷ reveals increase of sugar and of cellular content in a proportion of cases, but there appears to be no correlation between the occurrence of sequelæ and the changes in the spinal fluid.

The complications of spinal analgesia⁸ are still mostly unexplained, the attribution of headache to the calibre of the needle, leaking of fluid, injection of air, or seepage being obviously inadequate in many instances. Increased intracranial pressure, however produced, is an important factor. Koster and Weintrob have found intravenous injection of **Magnesium Sulphate** (2 c.c. of 50 per cent solution) to be a valuable remedy for the headache after operations under spinal analgesia.

S. J. Stabins and J. J. Morton,⁹ although warm advocates of spinal analgesia, maintain that for *all forms of heart disease*, whether due to valvular defects, irregularities in rhythm, or hypertension, **Ether** is the anaesthetic of choice. Nor would they choose spinal methods in cases of visceral perforation, acute peritonitis, localized abscess, or strangulation, their reason being fear of spreading infection from spasm of the stomach or intestines which occurs during spinal analgesia. They have used the method successfully in *paralytic ileus*.

E. Falkner Hill¹⁰ recommends a solution resembling spinocain but with the strychnine omitted. He gives good critical reasons for this alteration and for refusing to accept some of Pitkin's other claims, and maintains that safety is the main virtue of the Pitkin technique.

Preliminary Medication in Anaesthetics.—There is a constant addition to the drugs that can be used to pave the way to anaesthesia. Last year we devoted considerable space to **Avertin** (see MEDICAL ANNUAL, 1930, p. 32), and further contributions to the literature¹¹ bear out the high opinion expressed of it.¹² Now we have from America enthusiastic accounts of the value of **Amytal** (sodium iso-amyl-ethyl-barbiturate), which can be introduced orally, rectally, or by intravenous injection.¹³ Zerfas and McCallum recommend a 10 per cent solution which must be clear; opalescence should cause it to be discarded. When used as a preliminary to anaesthesia the usual preparation of the patient must be carried out. The intravenous route is the best, the solution being injected at the rate of 1 c.c. per minute. The amounts required are roughly from 7 to 15 gr., 1.5 grm. (22½ gr.) being regarded as a maximum. Unconsciousness is induced with great rapidity, and the injection should, therefore, not be made till a few minutes before the time of operation. The dosage works out at about 1 gr. to 10 lb. of body weight of the patient.¹⁴ Any general or local anaesthetic can be used in association with amytal. Many operations have been carried out under gas and oxygen or ethylene and oxygen after injection of amytal. It reduces the amount required by 10 to 50 per cent. Zerfas finds that it eliminates post-operative nausea and vomiting, and that it is a safeguard to the life of the patient when used before novocain and cocaine. After operations with amytal "patients slept steadily for a period of from twelve to twenty-four hours. They were usually sufficiently conscious in four or five hours to drink water. At the end of twenty-four hours they were wide awake with little or no memory of the events from the time of taking the amytal until the complete awakening."¹⁴ Absence of nausea and freedom from pain were noticeable during this period. Sometimes there was increased restlessness during recovery. There is occasionally a pronounced fall in blood-pressure. About 25 per cent of the patients needed the catheter during recovery.¹⁴

A new anaesthetic gas, **Cyclopropane**, is described by G. H. W. Lucas and V. E. Henderson,¹⁵ but as so far it has only been employed in the laboratory, no definite opinion can be formed as to its possible value in human surgery. In the laboratory the most interesting feature has been that surgical anaesthesia is

produced without any metabolic disturbance. The gas is prepared from trimethylene bromide.

Discussing *anæsthesia for major thoracic operations*¹⁶ Langton Hewer states that most of these operations should be done under pure **Nitrous Oxide and Oxygen** anæsthesia. If one or both pleural cavities are opened, differential pressure should be employed. When a bronchocutaneous fistula is present, this should be plugged previous to anæsthesia. In extreme cases of respiratory obstruction from thoracic tumour anæsthesia should be induced with chloroform and maintained by the endotracheal method. At a discussion on *anæsthesia for thoracic operations*¹⁷ at the Royal Society of Medicine, one important point that was made by several authorities was the rare necessity for the use of endotracheal methods in this class of surgery. I. W. Magill divided the operations concerned into two groups :—

1. Thoracoplasty, decortication, those for bronchial fistulæ, drainage of pulmonary abscess, and simple thoracotomy. The patients are usually in poor condition and are subject to frequent coughing to clear the lungs; they are usually toxæmic. In many the visceral pleura is partially or completely adherent to the chest wall and the operation need cause no respiratory embarrassment. In this group positive pressure is not essential for pulmonary ventilation. Nitrous oxide and oxygen with face-piece administration is all that is needed for the patients of this group.

2. In the second group of cases endotracheal insufflation is of the greatest value, although continuous high pressure is unnecessary in most cases. This group includes removal of mediastinal tumours, operation for diaphragmatic hernia and for some retrosternal goitres. Nitrous oxide and oxygen with a minimum of ether is the anæsthetic recommended.

The general conclusion arrived at was: (1) Local anæsthesia for minor operations; (2) 'Gas and oxygen', combined with intercostal nerve block, for major operations in which the pleura is adherent or is not to be opened; (3) Endotracheal insufflation for certain cases only, e.g., when traction on the mediastinum is likely to interfere with efficient pulmonary respiration. Magill holds that the anæsthetist should be prepared to intubate at a moment's notice, but that the wider his experience the less frequently does he meet the necessity for intubation.

Tudor Edwards¹⁸ pointed out the difference between the anæsthesia required for thoracoplasty done for bronchiectasis and tuberculosis and that done for chronic empyema. In the latter a dense fibrous barrier has formed over the lung surface, and when the cavity is opened there is no interference with the mechanism of respiration.

In a discussion on **Ethylene** H. P. Fairlie¹⁹ stated that it was in many cases the anæsthetic of choice. In operations where muscular relaxation and hæmorrhage were not of moment ethylene was adequate and safe because there was a fairly wide limit and ample warning of danger was given by cyanosis. It could be given from any good gas and oxygen machine and produced a more profound anæsthesia than gas and oxygen. It was very inflammable and therefore required great care in handling.

R. J. Clausen²⁰ gives a good account of the use of this gas and of means for avoiding its unpleasant smell, which, as pointed out by C. H. Hadfield,²¹ is not due to impurities but is inherent. Clausen has administered the gas for a case lasting two hours and twenty-five minutes. He advises preliminary hypnotics and generally about 20 per cent oxygen with the ethylene. For abdominal operations he combines ether with the gas, often only in minute quantities. Naked lights, cautery, and diathermy all forbid the use of ethylene. O. Mallebrein²² highly approves of ethylene in *midwifery*.

E. von Ammon and C. Schroeder²³ have investigated the effect of a number of gaseous anæsthetics and of avertin on the *blood acidity*. The general conclusion arrived at is that, although with practically every anæsthetic there is a reduction of the alkali reserve of the blood, yet this is always back to normal by the end of twenty-four hours.

Heart failure is described by A. W. Lidwill²⁴ as of three kinds: (1) Failure of the neuromuscular mechanism; (2) Failure of the muscle itself; (3) Antemortem clotting. Provided that the muscle had plenty of oxygenated blood it was still capable of contraction some time after its neuromuscular mechanism had failed, as long as some artificial means of stimulating the heart were forthcoming. For this purpose Lidwill has devised a machine which can be plugged into a lighting point. One pole is applied to the skin on which is a pad saturated with strong salt solution, the other pole is a needle, insulated except at its point, which is plunged into the ventricle.

The use of *amylal per rectum in obstetrics* has been found to produce effective anæsthesia in a large proportion of cases. In all there was a condition of amnesia so that after delivery and recovery from the drug the patient had no recollection of the labour. The dose used was from 25 to 30 mgrm. per kilo. of body weight. The patient goes to sleep slowly, complete relaxation occurring in from thirty to forty-five minutes.²⁵

Writing on a series of 1000 anæsthesias with **Avertin** J. Seiffert²⁶ describes one death in a subject of cholecystitis, and he does not now employ the drug in patients with this complaint. He has seen jaundice in children follow the administration of avertin. A comprehensive discussion on avertin was held at the Royal Society of Medicine,²⁷ and the general opinion emerged that, used in a dosage of 0.1 gr. per kilo. of body weight, without any preliminary morphia, it is a safe agent and a very valuable one for nervous subjects, especially those with Graves' disease. J. Dreessen²⁸ reports cases showing that chronic renal disease should be regarded as a contra-indication to the use of avertin.

The effect of **Thyroxin** on the elimination of avertin has been studied experimentally and clinically by Pybram,²⁹ and there appears to be good reason to believe that thyroxin actively hastens the elimination of avertin. Pybram has used it in doses of 2 c.c. injected intravenously. His researches were based on the definite evidence of increased tolerance of avertin on the part of hyperthyroid patients, a fact which has been noted also by others.

The administration of *ether per rectum for brain surgery* has proved highly satisfactory in the hands of W. Wood,³⁰ who reports fifty cases. Morphine beforehand is avoided. He has found 6 oz. of ether to give four hours' anæsthesia. The first injection is given one hour and a half before operation. This consists of:—

| | | | |
|------------|--------|-------------|--------|
| Chlorotone | gr. xx | Paraldehyde | 3ij-iv |
| Ether | 3ss | Paraffin | 3j |

Forty-five minutes before operation 6 oz. of ether and 2 oz. of paraffin are injected. **Atropine** is given as a routine. The patient is usually drowsy before the second injection. A light type of narcosis is produced.

Blood changes under ethylene have been studied by H. H. Trout,³¹ and he believes, as the result of experiment and of clinical research, that ethylene produces fewer blood changes than any of the other known anæsthetics. This is very likely due to the fact that there is less disturbance of the oxygen content of the blood than with other anæsthetics. Cyanosis is not seen with ethylene unless it is badly administered.

A study of the effect of morphia and of ether on kidney secretion showed that the secretion is greater when both drugs are used than when ether is used alone.³²

Some important practical deductions may be drawn from an *electrocardiographic study of the human heart during and after nitrous-oxide anæsthesia*.³³ The acute anoxæmia produced during anæsthesia with pure nitrous oxide seriously depresses the ventricular myocardium. The change is of a temporary nature and is quickly recovered from. Even in healthy subjects, however, recovery was sometimes not complete after several minutes. Obviously, pure nitrous oxide is a dangerous anæsthetic for an imperfect heart. In patients with heart disease the immediate change might be of a more dangerous nature and might be more lasting. Gas and oxygen is often chosen as the safest anæsthetic for a 'heart' patient who has to undergo a major operation. Actually, unless given with the utmost skill, it is more dangerous than ether. The principal results obtained in this investigation of the healthy heart under nitrous oxide

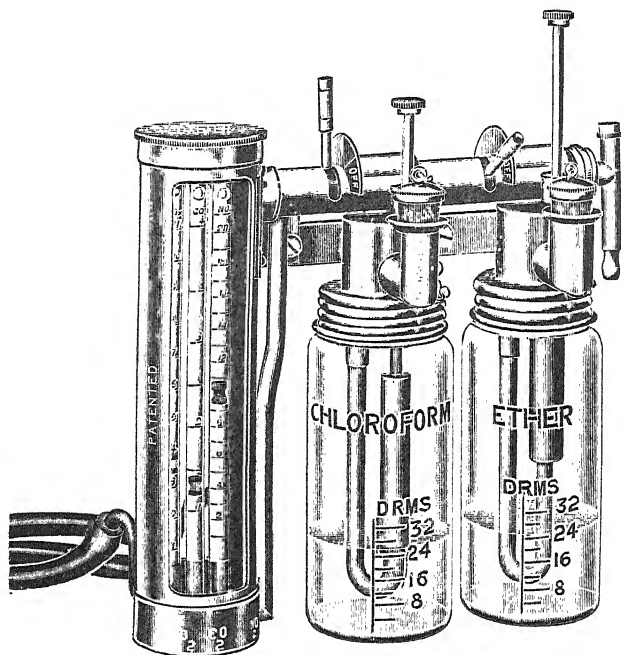


Fig. 1.—Flow-meter for administration of gas and oxygen.

were: (1) Tachycardia; (2) Reduction, abolition, or inversion of the T wave in Lead II; (3) Reduction in the R wave; (4) Variable changes in the P wave; (5) Little change in the P-R interval. The tachycardia and modifications in the T wave are attributed to the accompanying anoxæmia. The moral is not to rely on gas and oxygen in a heart case unless one can get all the anæsthesia necessary without producing any cyanosis.

The necessity for avoiding cyanosis is insisted on by H. E. G. Boyle³⁴ in a communication regarding the use of *nitrous oxide and oxygen in labour*. He finds that patients are far less exhausted, even after a long labour, when nitrous oxide is employed than when reliance is placed on chloroform. He believes that the pains are not slowed and are increased in strength. The gases are given only at the time of pains. When the head is on the perineum

ether is added to the gases. For long administrations of gas and oxygen the *flow-meter* (Fig. 1) appears to be a great improvement on the old 'sight-feed', in which there is often difficulty in distinguishing the holes at work in the tubes, and these holes are apt to work spasmodically.

Anæsthesia by intravenous administration of **Alcohol**³⁵ is recommended for most instances in which other anæsthetics are contra-indicated, and especially for patients who have lost large amounts of blood or are suffering from shock or toxæmia, for old and debilitated persons, and for heart disease patients. Children under ten are unsuitable subjects. About 2 to 3 c.c. of 90 per cent alcohol per kilo. of body weight is the dosage. The alcohol is given along with **Isotonic Glucose** solution, which can be obtained in sealed ampoules of 300 c.c. Mixture of alcohol and glucose is prepared in the proportions: Rectified spirit (90 per cent) 40 parts, glucose solution (25 per cent) 60 parts. This is kept ready-made in amber-coloured bottles. In the illustration (Fig. 2) A contains the isotonic glucose solution, B the alcohol mixture, and D is an air filter. When the injection is about to be started tap *a* is opened. The vein is punctured, and then *c* is opened and connected with the needle. When the isotonic glucose solution runs freely the needle is fixed with tape, *a* turned off and *b* turned on. Both taps must not be on at the same time. The injection must be stopped if either liquid reaches the lower extremity of the outlet tubes, or air will be injected. If the patient's condition gives alarm, the alcohol mixture is stopped and the glucose solution run in. Induction takes from five to fifteen minutes. Respiration is quiet. There is never laryngeal spasm.

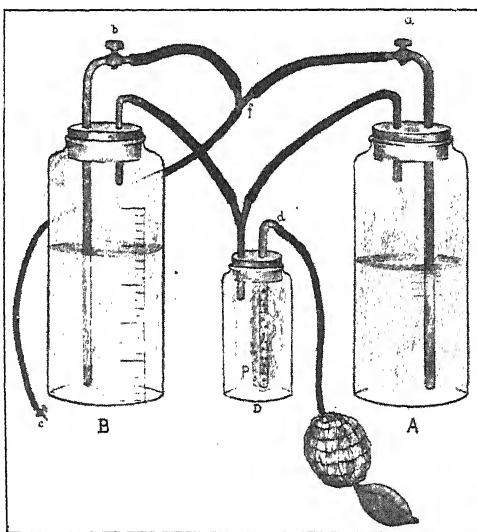


Fig. 2.—Apparatus for intravenous administration of alcohol.
(By kind permission of the 'Lancet'.)

Ether convulsions, the explanation of which remains a mystery, have been notified by various observers during the past year.³⁶ W. S. Sykes, after relating a fatal instance, provides a critical discussion of the theories advanced in explanation of this puzzling phenomenon, which is peculiar in having become comparatively common only in quite recent times.

An *explosion* resulting in the death of a maternity patient and her child is reported by R. Peterson.³⁷ Ethylene was being used, and the only proportions mentioned are 75 per cent oxygen with 25 per cent ethylene. Post mortem multiple lacerations of the lower part of the trachea, of the great bronchi, and of the lung parenchyma were revealed. The account gives no details which might help to explain the causation of the accident. There is valuable information regarding explosibility of anæsthetics in the report of the Committee on Anæsthesia Accidents.³⁸

For producing anæsthesia for short operations on children, especially

tonsillectomy, a method of administering *closed ethyl chloride with oxygen* is described. The author has used it over three hundred times.³⁹

The causation, prevention, and treatment of *vomiting* associated with anæsthesia are discussed by Ross McKenzie.⁴⁰ He distinguishes four main factors : (1) Psychic element in the patient ; (2) The pre-operative preparation ; (3) The anæsthetic agent and administration ; (4) Surgical trauma. He disapproves, as do most modern anæsthetists, of purgation, enemata, and starvation before anæsthesia. The effect of feeding with carbohydrates, with and without insulin, before anæsthesia, was tried. The patients who had carbohydrates but no insulin did as well as those who had both. Vomiting was apparently lessened by the carbohydrate preparation.⁴¹

Paraldehyde is recommended for premedication in the child. H. Sington⁴² recommends a solution in the proportions of paraldehyde 1 drachm, normal saline 1½ oz., with 5 per cent glucose, and the dosage is 1 drachm per stone of body weight. The child is asleep in about half an hour, and anæsthesia can then be induced without awakening him. The report is based on only 100 cases, in which there were but one instance of vomiting and one of post-operative excitement.

Percaine, after a four months' trial for local as well as spinal analgesia, is highly recommended by Lake and Marshall.⁴³ They use concentrations of 1-2000 to 1-1000, and 20 or 30 drops of **Adrenalin** to each ounce of the solution. As much as 7½ oz. have been used without toxic effect. Post-operative anæsthesia varied from three to six hours.

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ANAL FISSURE. (See DIATHERMY.)

ANEURYSM. (See BLOOD- AND LYMPH-VESSELS, SURGERY OF.)

ANEURYSMS, CEREBRAL. (See INTRACRANIAL HÆMORRHAGE.)

ANGINA PECTORIS AND CORONARY ARTERY DISEASE.

A. G. Gibson, M.D., F.R.C.P.

K. F. Wenckebach¹ makes some interesting remarks about angina pectoris from the clinical point of view. As regards the ambulatory form, he confirms Heberden's original account that it may last for many years and that the patient may die of something other than cardiac disease. He notes, what many practitioners may have noticed, that the disease is only found very rarely in a rural population. In the majority of cases the first appearance of the pain is connected with one of four factors—bodily movement, meals,

excitement, and cold. In respect of bodily movement, the pain comes on in the very beginning, after five, ten, or fifty steps have been taken, or even after so slight an activity as mastication or undressing. It often may remain absent during the continuous performance of slight work, but let there be a little extra exertion and the pain begins. The pain ceases almost at the moment the patient stands still, or, if brought on by cold, on entry into a warm room. This result is comparable in its effect to the action of nitrites. Shortness of breath is usually absent except in the form of cardiac asthma. The pulse is slowed, very hard, and tense. Sometimes the arteries may be demonstrated to diminish in size during a bout of pain. Some of the arteries also may become tender, and a case is mentioned in which a temporal artery was so affected. Some of these patients by living a restricted life may entirely lose their pain. Wenckebach then goes on to point out the identity of the anginal attack with the 'beginning check' such as may be observed in athletes doing strenuous tests, only in the athlete there occurs relief which we know as 'second wind'. In the initiation of bodily activity the frequency of the heart is immediately increased and the cardiac output enlarges, the blood-pressure rises perpendicularly, and consumption of oxygen and of carbon dioxide is increased. There is, in fact, a relative stasis of the blood in the arterial system, and when that stasis is extreme the athlete experiences a sense of unbearable suffocation and exhaustion, in which period—for instance in rowing—the effective work performed is materially retarded. It is only when the depressor reflex becomes active and the tissues are flushed with arterial blood that the athlete experiences a relief and the sense of distress disappears. This is exactly comparable to the effect of nitrites in angina pectoris.

Wenckebach insists that the pain in angina pectoris and in intermittent claudication is due to an arterial stasis and distension of the arterial lumen, and that the reason why pain is felt in angina pectoris, and by athletes before the second wind, is that the arteries are the seat of pathological distension. The relief of this stasis is only possible by opening the peripheral circulation, as occurs naturally with the depressor reflex, or in disease by the action of nitrites, quinine, or warmth, or from a failure of the muscle of the left ventricle. This would explain the disappearance of the anginal paroxysm with the onset of congestive cardiac failure. Such observations in proof of this view as the author has been able to make are confirmatory. At the moment of the relief of the paroxysm by the action of nitrite there is a sudden and marked narrowing of the aortic shadow. By percussion, also, the same effect can be demonstrated.

Is Angina Pectoris always due to Coronary Artery Disease?—This question is put by T. McCrae.² As characteristic of angina pectoris he suggests: severe pain referred to some part of the sternum or beneath it; its relation to causal features of exertion, emotion, anger, a heavy meal or exposure to cold, a forced cessation of activity during the attack, of radiation of the pain, sweating, relief by rest, nitrites, and morphia; and finally a return to the normal state within a few days. The history of a man of 60 is related who was subject to attacks of typical angina, and then suffered from a sudden attack of coronary occlusion from which he also recovered. The patient himself recognized clearly the difference between the two types of attack. Another suggestion of the difficulty of associating angina pectoris always with coronary artery disease is shown by the long continuance of anginal symptoms in some cases. A patient had his first severe attack in 1896, and he was seen by McCrae in an attack in 1910. It is difficult to associate this prolonged course with changes which are progressive in the coronary arteries.

Another group is associated with œsophageal and gastric symptoms. A patient had attacks for a period of four years which began with a feeling of gastric distension and a desire to belch soon followed by pain. He found that the passage of a stomach tube and gastric lavage gave him relief, and for three years he was without a serious attack. From radiological investigations of a case quoted it is supposed that œsophageal spasm is the cause of the pain.

Another case is recorded of a man, aged 47, with a history of two years of attacks, which ceased following treatment of a severe prostatitis. Though myocardial insufficiency, when it appears, usually gives relief to the angina, cases are related showing that this is not invariably so. The pain of a dilated aorta is generally referred to the upper sternum. It may radiate down both arms or the right arm only. The writer concludes that there are many causes for the anginal syndrome, mainly acting in the aorta, in the coronary arteries, in the myocardium, and in the nervous system.

Artificial Induction of Anginal Symptoms.—This forms the subject of three papers. G. I. Katz³ relates the case of a woman of 55 who suffered from an attack after every injection of insulin given for diabetes. M. Labbé, R. Boulin, L. Justin-Besançon, and J. Gouyen⁴ relate such attacks after the injection of ergotamine tartrate. In this case the woman was 49 and had exophthalmic goitre. She was given, after a course of other cardiac tonics, $\frac{1}{2}$ mgrm. tartrate of ergotamine at 10 a.m., and the attack occurred at 1 p.m. This was repeated twice, and he third attack was extremely severe.

S. A. Levine, A. C. Ernstene, and B. M. Jacobson⁵ find that anginal attacks can be brought on in those subject to them by the subcutaneous injection of 1 c.c. of epinephrin. Ten cases were investigated, and controlled by a similar procedure in 10 other cases of similar age and in 10 normal young adults. In all but one of the patients with angina pectoris the attack was precipitated. They suggest this method as a means of diagnosis when this is in doubt. In the anginal cases blood-pressure and pulse-rate were raised somewhat more than in the controlled groups.

A. C. Ernstene⁶ relates the case reports of three patients who recovered from coronary thrombosis, and of six others seen after an attack. Two of these patients suffered from hæmoptysis, probably from pulmonary infarction, and in the one case reported at length it did not disappear for ten days. The embolus in this case must have come from the right ventricle—a somewhat unusual place to see adherent clot. In the X-ray studies of these patients he notes that the pulsations of the heart are scarcely visible, and resemble a see-saw motion rather than that associated with contraction. A return to the normal contraction under the X rays is a favourable sign. He notes that there is a progressive fall in the systolic pressure for several days after the onset, and that favourable signs are a rise in the blood-pressure, an improvement in strength in the heart-sounds, and an increase in cardiac pulsation as shown under the X rays.

E. T. Freeman⁷ records a case of a man, age 56, with cardiac infarction which suggested that the thrombotic process was determined by a previous streptococcal infection which had attacked the perianal skin. This had practically cleared up, but he was still in bed. He then suffered from an attack of collapse with profuse sweating and large motions. He gradually recovered, but had a second attack on the eighth day. On the seventeenth day he had a sudden paralysis of the right side of the face and the right hand. Four months after he had an attack of great pain at the ninth right costal cartilage followed by jaundice. He again recovered. Though anatomical evidence is wanting, it is clear that the events in this case succeed one another in direct

relation, from the streptococcal infection to the thrombus in the coronary artery to the embolism from the left ventricle; but it is not quite clear that the jaundice was embolic, because the patient had been operated upon seventeen years previously for biliary calculi.

In a paper on coronary occlusion C. Bramwell⁸ calls attention to the fact that, as stated by Levine, subjects of this complaint are often well-built persons somewhat overweight, frequently of considerable physical strength, and have usually enjoyed good health. He draws attention to the intense shock and prostration due to a sudden fall in blood-pressure which commonly is associated with the other symptoms, and he contrasts this with the absence of shock in ordinary angina.

C. E. K. Herapath and C. B. Perry⁹ describe a fourth case of sudden death in one family, which family had been previously reported on by C. F. Coombs and J. J. S. Lucas in 1918. The man, age 43, had complained of an uncomfortable tight feeling across the chest. This passed off, and recurred in 1923, when the attacks were mild and could be described as the angina of effort. An electrocardiogram taken in 1925 showed little change, though there was a broadening of the R wave and a slightly bifid top in Lead III. In 1927 the attacks were associated with pain, the heart was not enlarged, but the aortic shadow was wider than normal. The first sound was rather higher pitched than normal. The blood-pressure was 120/70. The T wave in the electrocardiogram at this period was much less evident. A month later he died suddenly when getting into a tramcar. At the post-mortem there was slight atheroma in the thoracic aorta, but very marked atheromatous change in the abdominal portion, with several atheromatous ulcers and some calcification. The heart was somewhat enlarged, and the coronary arteries were hard and thickened. Skiagrams of the heart injected by the Gross method showed marked increase in the vascularity of the left side—a change usually seen in the aged. All four valves were normal. Microscopical examination of the myocardium showed areas of dense fibrosis; the coronary arteries in places were almost completely occluded, and showed massive intimal thickening which in places was vascularized.

Electrocardiographic Signs of Coronary Thrombosis.—These are described by John Parkinson¹⁰ in a discussion on cardiac infarction. In the first stage the R-T period is raised or rarely lowered over the iso-electric line. In the second stage this plateau is followed by a deep inversion of the T wave. The third or convalescent stage shows a gradual return to the normal.

E. Donzelot and R. Boucomont,¹¹ while they more or less agree with Parkinson's description, suggest that primary elevation of the R-T period is due to another new wave produced by a current of irritation taking origin at the site of the myocardial necrosis. As to the limits of the three stages, the first is short; the second lasts two or three months, during which the T wave gradually becomes more identifiable and inverted; and the third stage, also long, that in which the return is gradually made to the normal, lasts several months.

Endarteritis Obliterans of the Coronary Arteries.—A most remarkable case of this disease is recorded by F. W. T. Hughes and C. B. Berry.¹² The child was a girl, age 7 weeks, the third in a family with no tendency to disease or hereditary taint. The mother had had an attack of influenza in the sixth month of pregnancy. The labour, conducted by a midwife, was normal, and the child had been breast-fed until 6 weeks old. No ill health had been noticed until a final attack of cyanosis and rapid death. The heart was normal except for marked thickening and tortuosity of the coronary arteries, which stood out from the heart like cords. In the pulmonary artery there were some patches

of calcification. The authors were able to find two other such cases that have been recorded.

Heart-block in Coronary Thrombosis.—While grades of partial heart-block may be detected in cases of coronary thrombosis, severe grades and complete heart-block with Stokes-Adams attacks are infrequent. K. S. Smith¹³ describes one of these rare cases in a man of 59 who complained of fainting fits, breathlessness on effort, and pain on the left side of the chest. The attacks, which occurred over a period of several months, began by dizziness and loss of consciousness for a few seconds. Six months after these attacks he began to suffer from pain in the left side of the chest and breathlessness. Clinical signs in hospital all pointed to coronary obstruction.

Angina Pectoris after Influenza.—A. S. Hyman¹⁴ notes a type of angina pectoris that occurs after acute influenzal infection. Of 402 patients 9 developed this symptom, though none had been present before. All the patients were middle-aged, and the electrocardiogram showed severe myocardial injury in all. In three out of four patients whose details are recorded there was hypertension.

Angina Pectoris and Hyperthyroidism.—S. A. Levine and G. L. Walker¹⁵ refer to cases of heart disease, whose etiology is not recognized, that occur in hyperthyroidism. They refer to 6 cases which were reported by Lev and Hamburger in which angina pectoris had been associated with hyperthyroidism. The clue to the diagnosis, in the authors' opinion, lies in the general inspection of the patient. The skin is of a peculiar colour and tends to have a salmon hue. It is warm, moist, hyperæmic, and somewhat pigmented, especially in the upper part of the body. The patient's movements seem to be good, and more alertness is shown than is commonly associated with cardiac illness. Sometimes there is premature greyness of the hair. The transient glycosuria of hyperthyroidism often gives a clue, and a group of these cases show hypertension. Three of the authors' patients showed anginal symptoms, and they are inclined to think that, when these are present, coronary artery disease must be present as well. In one case there was an extraordinary benefit from the attacks following the taking of **Lugol's Solution**, 10 drops, three times a day. They suggest that in a doubtful case of angina this treatment might be used as a therapeutic test.

Significance of Pain of Anginal Character.—C. F. Coombs,¹⁶ by an investigation of patients with *cardiac pain*, seeks to discover whether any etiological relation exists between anginal pain and cardiac infarction. The age and sex incidence of the two groups correspond closely, and whereas angina of effort occurs with cardiac syphilis, high arterial tension, and senile degeneration of the heart, infarction occurs more commonly with the last two. In a series of nearly 1600 patients the percentage with pain is much the greatest in cardio-aortic syphilis—42·3; next comes senile degeneration with 29·2 per cent, and then high arterial tension, 16·3 per cent. Gross change in cardiac structure following pain occurred in 15 per cent of those suffering from senile degeneration, but only in negligible percentages amongst the other groups.

D. M. Baker¹⁷ has studied *left inframammary pain*, which is a common complaint in patients without physical signs of disease, with symptoms suggestive of physical or nervous exhaustion. It is not always easy to distinguish it from true angina pectoris. Twenty-five per cent of out-patients give it as their chief symptom. It is far commoner in women than in men, and very commonly seen at the menopause. It is of gradual onset, and may continue without intermission even for years. Such patients always show an undue tendency to fatigue. There is a hyperæsthesia of the skin and underlying

tissues in the origin of the left breast and subscapular region. The distinction from angina pectoris rests on the character of the pain, its site, and absence of relation to exertion. Treatment is very unsatisfactory, and the pain is liable to recur; the best results are obtained by reassurance, rest, and improvement in general health.

REFERENCES.—¹*Med. Jour. and Record*, 1930, Feb. 19, 212, and March 5, 238; ²*Amer. Jour. Med. Sci.* 1930, Jan., 16; ³*Presse méd.* 1930, Feb. 5, 20; ⁴*Ibid.* 1929, Aug. 17, 1069; ⁵*Arch. of Internal Med.* 1930, Feb., 191; ⁶*Amer. Jour. Med. Sci.* 1929, Sept., 383; ⁷*Irish Jour. Med. Sci.* 1930, Jan., 31; ⁸*Brit. Med. Jour.* 1930, i, 681; ⁹*Ibid.* 685; ¹⁰*Lancet*, 1930, i, 571; ¹¹*Presse méd.* 1930, March 5, 314; ¹²*Bristol Med.-Chir. Jour.* 1929, Autumn, 219; ¹³*Lancet*, 1930, i, 685; ¹⁴*Jour. Amer. Med. Assoc.* 1930, April 12, 1125; ¹⁵*New Eng. Jour. Med.* 1929, Nov. 21, 1021; ¹⁶*Quart. Jour. Med.* 1930, April, 233; ¹⁷*Lancet*, 1930, i, 1280.

ANKYLOSTOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

An account of a year's campaign against hookworm disease in the Solomon Islands is recorded by H. B. Hetherington and K. R. Stenson¹ under the Rockefeller Foundation. As the native taboos anything to do with human excreta it was impossible to examine all those treated for the degree of infection, but preliminary work showed a high infestation and an infection-rate well over 50 per cent, and mass treatment subsequently showed definite improvement in the general health. C. A. Lane² discusses the difficulties in estimating exactly the degree of hookworm infection by the methods of egg-counting in use, owing to variations in the size of the stools, the seasonal acquisition and the intensity of infection, the species of worm present, and the general health of the patients.

TREATMENT.—J. F. Kendrick³ reports on a trial of **Tetrachlorethylene** in 119 hookworm patients in a Madras jail with 2- to 3-c.c. doses in 2 oz. of concentrated **Magnesium Sulphate** solution on an empty stomach in the morning. The worms expelled during the first three days, during the latter two of which the magnesium sulphate was repeated, were counted, and those remaining were ascertained by subsequent treatment with **Carbon Tetrachloride** and **Oil of Chenopodium**. Good results were obtained with over 80 per cent of the worms removed by the first treatment, and the new drug proved more effective against ankylostomes than the older remedies; also it was as efficient against both forms as any former method. One case of intoxication with recovery was noted in the course of 1500 treatments. S. C. Nag⁴ reports toxic symptoms after carbon tetrachloride, with three deaths in children; the symptoms resembled a mild attack of hæmoglobinuric fever and suppression of urine.

REFERENCES.—¹*Med. Jour. of Australia*, 1929, June 29, 856; ²*Lancet*, 1930, i, 978; ³*Amer. Jour. Trop. Med.* 1929, Nov., 483; ⁴*Ind. Med. Gaz.* 1929, Dec., 683.

ANOREXIA, CONGENITAL.

Reginald Miller, M.D., F.R.C.P.

Loss of appetite is so frequent a symptom in children that it is met in all conditions of ill health as well as in states due to fatigue, emotional exhaustion, and lack of discipline. But there are many cases in which is seen a condition that cannot be adequately called mere loss of appetite, and may be conveniently spoken of as 'refusal of food'. In small babies this is shown by a complete lack of interest in the bottle, so that each feed takes perhaps an hour, and even then the bottle is but half emptied. The phrases used about the business are that the baby "does not seem to know what to do with its bottle" or that it "cannot be bothered to feed". In later years, when the child is old enough to be pressed to take food, the refusal of food develops into a very strenuous affair, meals become a perfect nightmare, and often if by some means or other

the child is forced to feed it is sick directly afterwards. In such cases there seems to be a complete lack of appetite, even a revulsion against food, for not even the beginnings of meals are wanted by the child.

In such instances as these the psychological aspect of the cases forces itself on the onlooker's attention, but the reviewer¹ has laid emphasis upon the fact that where refusal of food is persistent, strenuous, and habitual, it is unsafe to regard the symptom as of merely psychological origin. In his experience there is always some disorder of digestion at the bottom of such cases, even though the psychological symptoms are so conspicuous and some measure of relief may follow treatment on psychological lines. As an instance of refusal of food of an acquired type (as opposed to congenital), no better example can be given than the anorexia of coeliac disease. Here is seen every form of hysterical behaviour in connection with feeding, yet to those familiar with coeliac disease it is clear that the symptom depends upon the malabsorption of fat and clears up readily with a strictly **Fat-free Diet**.

To find anorexia of such severe grade as can be classed as refusal of food existing from birth is uncommon, but the group makes an interesting study. Undoubtedly mental enfeeblement will be a cause in certain cases, and in early life it may be far from easy to exclude this as the explanation of the congenital anorexia. G. F. Still² discusses this class of case in mentally sound children, and suggests that there is a delay in the development of the sensation of hunger. He notes that in premature infants desire for food may at first be lacking, and compares the delayed development to the curious absence of the desire to speak which may be found in children who ultimately prove to be normal. C. G. Kerley,³ under the title of "Chronic Mucous Gastritis with Loss of Appetite in Children", has described cases whose most prominent symptom is poverty of appetite. In his patients he was able to show that there was great gastric delay associated with chronic gastritis, and he suggests that the retention of food in the stomach is due to pylorospasm, the result of gastric irritation and plugging of the pyloric canal by the retained mucous secretion. R. Miller, with H. C. Gage,⁴ has described a series of cases in many respects similar to those of C. G. Kerley, under the title of "Gastromegaly and Chronic Duodenal Ileus in Children". In these the anorexia dated from birth and was sufficient to lead to very poor development in most instances. Vomiting was absent at first, but when the children grew old enough to be forced to take food against their will, vomiting began. It showed that great gastric stasis was present, and the appearance of much mucus in the vomit and stools demonstrated the presence of chronic gastritis. In addition great enlargement of the stomach was present in all cases, and with careful and repeated inspection of the abdomen from time to time visible gastric peristalsis, taken to indicate hypertrophy of the stomach wall, could be discovered. Skiagrams confirmed these points, and the conclusion was therefore reached that there was some slight congenital obstruction to the evacuation of the stomach, causing gastric stasis and secondary gastritis (as is seen in hypertrophic pyloric stenosis in infants). X-ray examination seemed to prove that the obstruction was not at the pylorus, and in two severe cases where the progress made was dangerously slow, operation showed that there was compression of the duodenojejunal flexure by the root of the mesentery. Other cases of less severity responded to treatment by a **Dry Diet**, with drinks between meals, and the administration of gastric antiseptics such as **Glycothymoline**. Spontaneous improvement seems to occur somewhere between the ages of 5 and 7 years.

REFERENCES.—¹*St. Mary's Hosp. Gaz.* 1930, 31; ²*Practitioner*, 1930, cxxv, 40; ³*Med. Jour. and Record*, 1930, Jan., 23; ⁴*Arch. of Dis. Child.* 1930, v, 83.

ANOREXIA NERVOSA.*Henry Devine, M.D., F.R.C.P.*

J. F. Venables¹ has made a study of the pathogenesis and treatment of nine cases of anorexia nervosa. It is now generally agreed, the writer observes, that the condition is always due to psychological causes, and that such manifestations as circulatory failure, amenorrhœa, and intractable constipation are all secondary to the starvation resulting from anorexia, and are never factors in its production. The use of gland extracts, and abdominal supports for supposed visceroptosis, are therefore to be deprecated.

SYMPTOMS.—The symptoms appear almost without exception in early adult life, a time when psychological difficulties are likely to arise. They develop in response to some failure on the part of the patients to adapt themselves to their environment. The trouble which they are unable to face may be trivial or it may be serious, but it is always very real to the patient, and it may be quite transient. The severity and duration of the primary psychological disturbance are of little importance, as, if the patient reacts by a gradually increasing abstention from food, anorexia nervosa may become established, and once established, even from an apparently trivial cause, the condition may advance to a state in which life is actually in danger.

ETIOLOGY.—Causes may be connected with sex problems, but others are equally capable of producing the condition. Thus a patient's fear that he may not succeed in a future examination results in loss of appetite. He soon transfers his anxiety to the physical aspect and readily persuades himself that in this lies the explanation of his failure to do himself justice in preparation for his future examination; he is able to eat less and less, and from this condition to the establishment of anorexia nervosa is a short step, and then the problem of his success or failure is shelved, and disappears in the more immediate problem of his health.

TREATMENT.—As regards treatment, Venables states that every patient with anorexia nervosa can be persuaded to eat normally. The condition is hysterical, and the diagnosis of hysteria is only justified when the patient is subsequently cured. No patient should remain uncured, and most certainly no patient should be allowed to die. Directly the diagnosis has been made treatment should be started. A full explanation should be given to the patient as to the condition present. It is useless to ridicule the sensations of which he complains. They are real. Discomfort, distension, repugnance of food, and nausea—all are real. The patient has become hypersensitive to abdominal sensation. This is explained, and at the same time it is pointed out that in spite of his sensation he can nevertheless eat, and his stomach, which is normal, can accommodate the food as it is of normal size.

Anyone starting to treat a case of this type must be prepared to sit for almost any length of time over a meal. He must never acknowledge defeat and he must never lose his temper. The opportunities for annoyance will be many. He must remember that pure obstinacy is the exception; the patient has a real aversion to food in any form. He must be prepared to fight over every mouthful. With each successive meal eaten the task generally becomes easier, and it seldom takes more than a week to establish a normal habit, when the patient can be left to have his meals without the presence of the doctor. From the first a full diet must be taken, no matter how insufficient it has been in preceding months. Psychological causes must never be discussed at first, unless they are so obvious that they cannot be ignored. It will be found that after the symptom of anorexia has been cured without loss of temper on the part of the physician, the patient's confidence has been gained. Then, if necessary, psychological causes become more readily accessible and discussion becomes more fruitful. Venables does not favour prolonged and deep analysis.

The immediate cause is seldom hard to find, and a few frank discussions, coupled with any necessary adjustment of circumstances, should be all that is necessary. This method has been adopted in all the cases cited in this study, and none has relapsed, nor have other psychoneurotic symptoms supervened. All cases should be kept in bed, and it is generally necessary for the patient to have a special nurse. Treatment in the patient's home is most undesirable, and anxious parents should be excluded.

REFERENCE.—¹*Guy's Hosp. Rep.* 1930, May, 213.

ANUS, IMPERFORATE. (See RECTUM, PROLAPSE OF.)

ANUS AND RECTUM, PROLAPSE OF. (See also RECTUM, PROLAPSE OF.)

J. P. Lockhart-Mummery, F.R.C.S.

R. Demel and G. Adamek¹ divide prolapse into anal and rectal according to the degree of the prolapse—that is, anal when the mucous membrane only comes down, and rectal when the muscular wall is down. They suggest that anal prolapse in children can be cured without operation by general tonics and strapping the buttocks together. In rectal prolapse in children they advise the use of a silver ring inserted into the tissue outside the anal canal, or using a strip of fascia for the same purpose (this latter method has not proved very successful in the hands of English surgeons). In cases of anal prolapse in adults they advise some form of plastic operation upon the sphincter, or treatment with the actual cautery. For rectal prolapse they advise some form of fixation of the rectum, such as Mummery's operation combined if necessary with strengthening of the pelvic floor. They find that resection of the prolapse is not a very satisfactory method and relapses are frequent. In very bad cases of prolapse they recommend the combination of several methods and doing the operation if necessary in two stages. The most difficult cases are patients with nervous diseases or lunatics.

REFERENCE.—¹*Deut. Zeits. f. Chir.* 1929, Nov., 355.

APHONIA. (See LARYNX, DISEASES OF.)

APPENDICITIS.

A. Rendle Short, M.D., F.R.C.S.

ETIOLOGY.—E. Desmarest,¹ of Paris, describes some cases where appendicitis closely followed an injury. He suggests that the sudden rise of pressure may force faecal matter or gas into the mucosa, especially if a concretion is present.

D. P. D. Wilkie² insists, as he has done before, on two different types of origin of appendicitis—the one primarily inflammatory with early fever and malaise, not very urgent; and the other primarily an obstruction due to a kink, concretion, or stricture, beginning with acute colicky pain and going on rapidly to gangrene. Operation is urgently needed.

DIAGNOSIS.—N. A. Sinakevitch and N. N. Toporkoff,³ of Irkutsk, describe several cases in which the gastric crises of tabes were mistaken for appendicitis. The correct diagnosis was indicated by the absence of the light reflex, absent knee-jerks, and freedom from pain after a course of iodides.

According to A. Orliansky,⁴ the appendix can be rendered visible by barium skiagraphy in nine cases out of ten, especially after purgation. Tenderness on pressure over the visualized appendix is not good evidence of appendicitis, but a dilated club-like end is. Appendicular stasis does not prove a diseased appendix.

F. W. Sumner⁵ says that careful palpation of the abdominal muscles over the right iliac fossa will often detect an increase of tone in cases of appendicitis before actual rigidity is present. That we would do well to improve our diagnostic methods is shown by the confession that of 1298 cases

sent into hospital at Zurich as acute appendicitis (in five years), 252 were incorrectly diagnosed as such, and that 6 per cent of the patients operated on had no appendicitis (Clairmont⁶).

TREATMENT.—Hamilton Bailey⁷ believes in the **Ochsner-Sherren (Delayed) Treatment** for certain cases of acute appendicitis. The details are: high Fowler position, no food but water for four days, no morphia, no aperients. Up to fifty hours from the time of onset, immediate operation is advised. After fifty hours, the Ochsner-Sherren method is normally followed, and the appendix removed two or three months later. Age under 5, presence of hyperæsthesia (meaning appendix still unperforated), a doubtful diagnosis, general peritonitis, or history of a recent purgative, are indications for operation even after fifty hours. Cases on Ochsner-Sherren treatment that show a rising pulse-rate or complain of pain usually need operation. Appendix abscesses will usually resolve; if they grow bigger, are bulging, fluctuate, or fill the pelvis, or if the temperature stays up several days, they need opening. In cases of general diffuse peritonitis it is usually better not to operate, except in children, or when an appendix abscess has burst. The figures given are:—

| | | |
|---|---------|------------|
| Total number of cases of acute appendicitis | .. | 315 |
| Immediate operation | | 242 |
| | | (4 deaths) |
| Treated by Ochsner-Sherren method | .. | 73 |
| | | (1 death) |

Stanley Raw⁸ publishes a study of 509 cases in which the appendix was removed, with 4 deaths, and 40 cases in which operation was performed but the appendix was not removed, with 7 deaths. He practises immediate operation at every stage of the disease, the mortality being 2 per cent.

Syphilitic Appendicitis.—Evans, Griffith, and Rowlands⁹ relate two cases of operation for symptoms of acute appendicitis in which the Wassermann reaction was positive, mucous patches were present in the mouth and throat, and the histological findings in the removed appendix were consistent with those of syphilis.

REFERENCES.—¹*Presse méd.* 1930, March, 313; ²*Canad. Med. Assoc. Jour.* 1930, March, 314; ³*Zentralb. f. Chir.* 1929, Nov., 2823; ⁴*Brit. Med. Jour.* 1930, i, 330; ⁵*Ibid.* 106; ⁶*Munch. med. Woch.* 1928, No. 3; ⁷*Brit. Med. Jour.* 1930, i, 140; *Ibid.* 483; ⁸*Ibid.* 11.

APPENDICITIS AND PERITONITIS IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

Appendicitis.—It may seem that the diagnosis of appendicitis has already been fully explored, but a paper by Emil Fleisser¹ on this subject will repay a careful perusal. This author believes that two characteristics of childhood increase the difficulties of abdominal diagnosis—the child's inability to locate the pain, and the remarkable degree of insensibility which the child may demonstrate to pain. In the latter connection the author instances the relative freedom from pain associated with a septic tooth pulp and acute otitis media. The questions of pain sensitivity and sensibility are difficult ones; they depend upon such a variety of influences that to formulate general rules regarding them is impossible in our present state of knowledge. It is probably correct, however, to say that children of a certain type display a depressed sensibility to pain.

Starting from this proviso, Fleisser discusses the diagnosis of appendicitis and indicates a number of features which he considers distinctive of the disease. Tenesmus of the rectum and of the bladder have been noted; it is obvious that these signs depend upon the contact between a diseased appendix and the

pelvic organs. Similarly, unexplainable limping is mentioned as an important sign, and so it is, but the cause of the sign (contact of the appendix with the psoas muscle) should have been given. Variations in the quantity of urine is mentioned, but no explanation is offered. It might with advantage have been explained that the variation is encountered when the appendix lies in contact with the ureter or the pelvis of the kidney. Recurrent attacks of vomiting sometimes complicated with fever are a feature in the clinical history which is universally recognized. Vomiting associated with diarrhoea is a peculiarly suspicious feature of the case-history in Fleisser's opinion.

Where the physical examination is concerned, Leiner's sign—the absence of the abdominal reflex on the affected side—is considered to be a constant and valuable indication of underlying infection. Thrust ('Stoss') palpation, the finger-tips being suddenly pressed into the abdominal wall, is recommended as a means of examination. As the fingers are withdrawn an acute exacerbation of pain is induced. The importance of a rectal examination is insisted on, but we cannot agree with the author's recommendation that a long vulcanite nozzle should be employed as the exploring medium.

Peritonitis.—The subject of primary peritonitis in children is discussed by several observers. A. G. de Sanetis and R. A. Nichols² record 21 cases resulting from infection by pneumococci and streptococci.

The general facts of this disease are well recognized, but dispute continues to centre round the question of treatment, and more especially the problem of whether early operation is indicated or whether there should be delay until the infection has become localized, the infection being meantime treated by general measures. The authors of the above-mentioned paper recommend early operation, and their reasons are evidently based on the question of relative mortality. They point out that in 8 cases in which operation was postponed the mortality was 100 per cent, while in 13 cases treated by drainage the death-rate was 76·9 per cent, the total mortality figure being 85·7 per cent.

Diametrically opposed to this view is the article by P. Mathieu and J. Davicid.³ The observations are based on 7 cases treated in the past year, 3 of which succumbed shortly after operation. Put briefly, the authors' contention is that early operation is a mistake because the interference is at a time when the child is suffering from a septicæmia of which the peritonitis is but a local evidence; intervention only complicates the picture and encourages a fatal pulmonary development. In support of this contention a number of statistics is recorded, the most impressive of which are those of Budde. This recorder experienced a 90 per cent mortality in association with immediate operation, 33 per cent in delayed operation, and 6·7 per cent in late operation. Attention has been drawn to facts of this kind on many occasions, but to make the argument effective it is necessary to know what percentage of cases lived sufficiently long to permit of late operation. It has hitherto been suggested that the small mortality of the late operation really indicates a survival ratio.

Herrman's recent work on experimental peritonitis and peritoneal immunity may throw some light on the question. The ultimate conclusions arising out of a long series of experiments were that peritonitis depends on immunity, that it is a defensive tissue reaction, and that in the presence of a complete or perfect immunity there would be no peritonitis because the organism would be destroyed so rapidly and completely that no defensive mechanism would arise. If we apply these conclusions in a clinical sense, we must accept the wisdom of delayed operation, for otherwise we are interfering with the 'locale' in which a general immunity is being induced.

REFERENCES.—¹*Munch. med. Woch.* 1929, Sept. 13, 1542; ²*Arch. of Pediatrics*, 1929, xlv, 17; ³*Presse méd.* 1929, July 13, 909.

ARRHYTHMIA AND ELECTROCARDIOGRAPHY.

A. G. Gibson, M.D., F.R.C.P.

Auricular Fibrillation.—In regard to the etiology M. Campbell¹ has analysed 100 cases identified by the electrocardiogram amongst 500 consecutive patients in the heart clinic at Guy's Hospital: 5 per cent of these cases were identified on clinical grounds alone. The cases included both those with paroxysmal fibrillation and those with other disorders: 53 cases were rheumatic in origin and included 42 cases of mitral stenosis, 6 of which had aortic incompetence as well; 2 had aortic incompetence alone, and 3 aortic stenosis. It is noted that only one of these patients had a raised blood-pressure. The second most important etiological factor was hyperthyroidism, seen in 11 cases, and its number included 4 out of the 5 cases of paroxysmal fibrillation. The third group included arteriosclerosis and other causes in 36 patients. In this group high blood-pressure was not a common feature; in only 4 was it above 200 mm., and in 8 others there was a blood-pressure of 170 or more: 12 per cent had a blood-pressure above the normal. It is curious that only two patients had any evidence of syphilitic disease, and Campbell notes the remarkable absence of high blood-pressure in early middle life, active rheumatic infection, infective endocarditis, and congenital cardiac disease. In one case only was there a possibility of trauma being the cause. Other authors have found mitral stenosis as the cause of fibrillation in 36 to 66 per cent of cases. In the present series it was 42 per cent. The age incidence in the three main groups shows that the rheumatic group is most commonly found between the ages of 25 and 50, the hyperthyroid group between 35 and 55, and the arteriosclerotic group between 55 and 70.

The beginning of fibrillation can often be determined with accuracy by taking a careful medical history, for the onset frequently fixes itself upon the patient's memory. In many of the above cases the mode of onset is stated, and it is curious that in only one was there a suspicion that it had been brought on by heavy work. In less than one-tenth symptoms were not referable to the heart. The symptoms are frequently breathlessness, palpitation, or indigestion. If fibrillation remains untreated, it is likely to go on to congestive failure. The electrocardiogram may show predominance of one or other ventricle, and this predominance may be of value in determining the lesion affecting the heart. In the mitral stenotic cases there is predominance of the right ventricle, whereas in the aortic cases there is predominance in the left. In one case in which the ordinary signs of mitral stenosis had been obliterated it was possible to make the correct diagnosis by means of the electrocardiogram. While a large number of patients with this disorder go on to congestive failure, a much smaller group shows no signs of cardiac failure; it is more often seen when the ventricular rate is about 90, and appears to have no relation to treatment by digitalis.

L. M. Hurxthal² has studied 59 cases of *post-operative paroxysmal auricular fibrillation* in thyroid patients to compare the relative efficiency of digitalis and quinidine in restoring a normal rhythm. He did not find that digitalis, though it slows the heart, has any action in stopping the paroxysm, while **Quinidine** has proved successful in all cases of the paroxysmal type. In the cases with established fibrillation quinidine was successful in 88 per cent. Fifteen per cent of cases operated upon were restored to a normal rhythm with **Iodine** alone, and with all three remedies—**Iodine**, **Thyroidectomy**, and **Quinidine**—restoration to normal occurred in 76 per cent. A careful selection of cases for quinidine treatment is necessary, and the author excludes a tendency to embolism, mitral stenosis with either fibrillation or congestive heart failure, and cases of congestive heart failure. His plan of dosage is

to give 3 gr. of quinidine sulphate after breakfast, and, if no unpleasant symptoms arise, to give 6 gr. every two hours with half a glass of water, until the pulse is regular or until unpleasant symptoms arise or a total of 39 gr. has been given. If this method fails, the patient is given 6 to 9 gr. after each meal for several days.

H. Cookson³ notes that the *prognosis of auricular fibrillation* is better in the arteriosclerotic group than in the rheumatic. Embolism in the series of mitral stenosis examined occurs no more frequently during fibrillation than when the rhythm is normal. With partial heart-block the outlook for patients with fibrillation is slightly better. Nor does fibrillation add to the gravity of a case in which complete heart-block is present.

The same writer¹ brings together the available knowledge of *auricular fibrillation in children*. The earliest case was in a boy of 4, though another in a child of 3, supported by a graphic record, is also recorded. Cookson records 30 cases in children amongst 1164 cases admitted to the London Hospital in fifteen years, or 2.5 per cent. Five cases from other sources are added, making a total of 35. Rheumatic heart disease was the etiological factor in all cases, and a history of acute illness was lacking in only 6. In 25 cases out of the total of 35 studied by the author there was mitral stenosis, and in 4 of these there was aortic incompetence as well. Established auricular fibrillation in those under 17 is a serious condition, more serious than in adults. In 23 of the cases studied the average duration of life after the onset of abnormal rhythm was ten months, and during that period the patients were confined to bed with congestive heart failure.

Heart-block.—J. M. Read⁵ draws attention to certain features of *complete heart-block*. Two cases, a woman of 47 and a man of 77, are related, in which the heart-block was discovered accidentally. Neither of these suffered from any circulatory insufficiency. In the woman the heart-block had originated probably in an attack of diphtheria in childhood, and in the man it had been present probably for ten years. The size of the heart is usually above normal as a consequence of the increased stroke-volume. This size is due partly to muscle hypertrophy and partly to a larger capacity of the cardiac chambers. The author quotes the fact that this increased stroke-volume has been experimentally demonstrated recently in two cases. In association with this the pressure shows a large difference between systolic and diastolic figures—in other words, the pulse-pressure is high. Another clinical feature is that the first sound, though not usually loud, shows occasional marked accentuations, due probably to the synchronism of ventricular and auricular systoles.

In a paper on the *Stokes-Adams syndrome* Ewen Downie⁶ has brought together a large number of the facts that are mostly scattered in literature, and has added a critical analysis of 27 cases of heart-block under the care of Dr. J. S. Goodall at the National Hospital for Diseases of the Heart, London. Twenty of these patients were males, and the youngest was 22 years old when first observed. Etiologically cases fell into three groups: syphilis, 4; toxic, 5; and degenerative, 18 cases. The toxic group contained cases due to acute influenza and infections of unknown etiology. There appears to be no relation between the Stokes-Adams syndrome and the type of heart-block, whether variable or constant. Of 8 patients, 6 with variable auriculo-ventricular dissociation showed the syndrome, and 7 only out of 19 of those with constant auriculo-ventricular dissociation. The common symptoms are dyspnoea, vertigo, pain, palpitation, and exhaustion, in that order of frequency, and there appears to be no marked difference in the two types of auriculo-ventricular dissociation. The average systolic pressure in both types is 160 mm., and the diastolic between 70 and 80 mm. Arteriosclerotic changes are

not a marked feature of the cases. Both types show a slight predominance of enlargement of the heart to the left, some to the right and left, but a proportion have no enlargement at all. Seven cases had an associated aortic incompetence, one a mitral stenosis, and two auricular fibrillation.

As regards prognosis, this small series of cases suggests that the outlook is grave. More than one-third of the patients are now dead, with an average duration of life of six and a half years after symptoms had set in. The outlook is worse in those cases associated with variable block, and better in those with constant block. Reversion to a normal rhythm is rare, and occurs only in syphilis and certain toxic cases. The development of heart-block leads to a considerable reduction in the activities of the patient.

The clinical significance of *right branch bundle block* is the subject of a paper by F. Bach⁷ from an examination of 80 cases which fall into three groups—cardiovascular degenerative, syphilitic, and rheumatic. In the first and largest group the prognosis is reasonably good, and the same is true of the rheumatic group, but from the records of 17 cases in the syphilitic group the prognosis is bad.

Tachycardia.—M. B. Strauss,⁸ in an article on paroxysmal ventricular tachycardia, notes that the diagnosis can only be made for certain by means of the electrocardiogram, in which there must be evidence that the impulses producing the tachycardia arise within the ventricles. The QRS complexes are abnormal. The identification of independent auricular waves occurring at a slower rate would be a confirmatory sign, and further confirmation would be given by the presence in the interparoxysmal period of isolated premature ventricular complexes of the same shape as those in the paroxysm. As to the experimental causation, the author refers to Lewis's work on the ligation of the coronary arteries in animals and the production of paroxysms of tachycardia of ventricular origin in both dogs and cats, particularly by ligation of the right coronary artery. The author has been able to find altogether 64 cases, 2 of which he reports. It occurs more commonly in the fifth and sixth decades in men and is associated with hypertension and coronary artery disease, though other types of cardiac abnormality are included. The clinical diagnosis is difficult, but may be suspected when paroxysmal tachycardia supervenes in a case of long-standing heart disease, particularly if large doses of digitalis have been given, and also in coronary artery occlusion. He notes that there is a slight irregularity on auscultation which is not found in other forms of tachycardia, and the vagal stimulation and ocular pressure are never effective in terminating a paroxysm. **Quinidine Sulphate** is the only therapeutic measure and has been successfully employed in a number of recorded cases. In some the dosage has been high, as much as 120 gr. per diem. The prognosis is not necessarily bad in the absence of gross cardiac disease.

ELECTROCARDIOGRAPHY.

A. A. F. Peel⁹ has recorded a series of cases of *acute rheumatism* in which he has observed a transient inversion of the T wave in Lead III and a diminution in the amplitude of the same wave in Lead II. This is associated in the majority of cases with active endocarditis. This inversion is more than twice as frequent in subjects of acute rheumatism as in normal persons or those suffering from some other disease. Comparison with a series of six cases of Graves' disease with tachycardia only showed that the inverted T wave was not more frequent than in the normal.

D. Scherf¹⁰ reports a case of a woman, age 54, in whom significant changes in the electrocardiogram were the result of *pericardial effusion*. The P and

T waves were absent and the QRS complex was very insignificant. After paracentesis of 300 c.c. of clear fluid, both P and T waves returned and the QRS complex became more marked. The explanation is that the fluid acts as non-conducting material and prevents the action current from being properly registered. The author refers to the importance of this observation as a means of explaining cardiac insufficiency difficult to account for on physical examination, and especially when the output of the heart appears to be deficient. Experimental confirmation of this view of the action of pericardial effusion was found in animal experiments.

In 100 patients who had suffered from *non-rheumatic infections*, including no cases of scarlet fever or diphtheria, C. T. Burnett and G. F. Piltz¹¹ found that 3 showed definite signs of cardiac injury, though 28 showed signs in the electrocardiogram. In one of the three cases there was a transverse myelitis, and the patient developed a tachycardia which was associated with a prolonged P-R interval. The heart was normal to physical examination. Two other cases were associated with clinical influenza. In one, a man of 30, thirteen days after a tonsillectomy, developed a bronchopneumonic patch and a slight degree of heart-block with a pulse-rate of 50. Complete recovery ensued. In another case, a woman of 45 suffered from an antrum infection after influenza and subsequently developed a coronary thrombosis. There was inversion of the T wave, which disappeared in three months.

In the discussion which followed the reading of this paper at the American Medical Association in 1929, J. M. Read referred to two cases in which heart-block had persisted. In one case, a woman of 48, it appeared to have started following an attack of diphtheria at the age of 6. In another case, a man of 53, heart-block had apparently begun from an attack of pneumonia at the age of 23. The significance of the paper lies in the importance of the electrocardiograph in identifying these rarer cardiac lesions, and as a means of explaining some of the cardiovascular features of infections in general, especially of influenza.

H. W. Jones and R. E. Roberts¹² have devised a graphic method, following the work of Carter, Richter, and Greene, for determining the *electrical axis of the heart* from the electrocardiogram in Leads I and III. This electrical axis varies under normal conditions such as respiration; it is also shifted by lying on the right or the left side. It forms a useful test in cases of adherent pericardium. There is normally a right-sided predominance in the first few weeks of life.

REFERENCES.—¹*Guy's Hosp. Rep.* 1929, July, 261; ²*Amer. Jour. Med. Sci.* 1930, April, 507; ³*Quart. Jour. Med.* 1930, April, 309; ⁴*Lancet*, 1929, ii, 1139; ⁵*Arch. of Internal Med.* 1930, Jan., 59; ⁶*Med. Jour. of Australia*, 1929, June 22, 822; ⁷*Quart. Jour. Med.* 1930, April, 261; ⁸*Amer. Jour. Med. Sci.* 1930, March, 337; ⁹*Glasgow Med. Jour.* 1929, Dec., 291; ¹⁰*Wien. klin. Woch.* 1930, March 6, 298; ¹¹*Jour. Amer. Med. Assoc.* 1929, Oct. 12, 1120; ¹²*Quart. Jour. Med.* 1929, Oct., 67.

ARTERIES, DISEASES OF. (See also ANGINA PECTORIS AND CORONARY ARTERY DISEASE; BLOOD- AND LYMPH-VESSELS; BLOOD-PRESSURE; EMBOLISM, PARADOXICAL.) *A. G. Gibson, M.D., F.R.C.P.*

Non-syphilitic Lesions of the Abdominal Aorta.—Though these are so common, the references in literature to symptoms pointing to this artery are rare. Huchard and also Pal described a syndrome, 'angina abdominis', which they ascribed to this cause. Louis Ramond¹ describes a case of a woman of 80 who suffered from painful abdominothoracic crises. They consisted of very painful cramps encircling the body; they were definitely constrictive, and accompanied by great agony, considerable agitation, and inability to find a position of the body in which any comfort could be obtained. Neither move-

ment nor complete relaxation had any effect, and nothing seemed to augment a paroxysm when once established. The crises lasted half an hour to two hours, and in one instance for four hours. The termination was frequently associated with vomiting or the regurgitation of an acid secretion. They came on without any indication of causation. The patient had suffered from abdominal discomfort since the age of 20 years, and had frequently experienced pains of a burning and cramp-like character. Seven years previously she had suffered from retrosternal excruciating pain brought on by effort. These attacks only occurred during a little over a year and then ceased. One year subsequently to this she had had attacks of local ischæmia in the fingers, and again later intermittent claudication in the legs, which had disappeared two years previously. There was no sign of syphilis; she had never had any children or miscarriages. Abdominal examination showed a tumour mass which was found to be the abdominal aorta dilated, elongated, and curved. The blood-pressure was not raised—150 max., 100 min. There was no sign of disease of the alimentary system or of stone in the renal or biliary systems. The author refers to the radiological evidence: a dilatation of the aorta above its bifurcation and the presence of a dark band indicative of the thoracic aorta above the diaphragm. For many years the reviewer has had under observation a case that is probably of this nature—a woman of 68, constantly complaining of abdominal pains, which occasionally spread down the inner aspect of the thighs. From time to time there has been mild bacilluria, occasionally with pus, in a centrifugalized deposit. The abdominal aorta, as determined by X rays, is calcified.

Intermittent Claudication.—M. Labbé, J. Heitz, and Gilbert Dreyfus² report a case which indicates a clinical history not uncommon in this disease. A woman of 49 had a hysterectomy for fibromyoma; this was followed by a phlebitis of the left leg, which kept her in bed for two months. Ten years after she had a similar phlebitis in the right leg, with a febrile period, and this was followed by marked œdema. At the age of 67, eighteen years after the first thrombosis, she began to have symptoms of intermittent claudication in the right leg, which increased in severity and ultimately necessitated amputation. Both the femoral artery and vein were thrombosed, and a section across both in Hunter's canal showed the main femoral vein subdivided into four compartments which had obviously been caused by previous thrombosis and recanalization. There were recent thromboses in all these canals and in a small satellite vein. The femoral artery showed a vegetating endarteritis encircling more than half of the circumference at the point of section.

Ayerza's Disease.—Two cases of Ayerza's disease are reported by G. L. S. Konstam³ and by D. C. Hare and J. M. Ross¹ respectively. The disease is one which is now well recognized in literature, but which was first taught as a clinical entity by Ayerza in 1901, though it was not published until 1913 by one of his pupils. The anatomical basis is disease and dilatation of the pulmonary arteries which in most cases have a syphilitic origin; the arterioles are narrowed or blocked, and consequent dilatation of the right heart is seen. The disease develops insidiously, with two main symptoms—dyspnœa and cyanosis. Dyspnœa comes on first with exertion, and may be present for as long as four years before the second symptom, cyanosis, appears. The cyanosis in the late stages may be very intense, and this gave rise to Ayerza's name 'cardiacos negros'. Other symptoms are a sense of oppression on exertion, hæmoptysis, somnolence, and clubbing of the fingers. To the X rays there is a distinct dilatation of the pulmonary artery seen just below the knuckle of the aorta on the left side. There are no constant physical signs in the lungs, though emphysema and œdema may be found. In the electrocardiogram there is a right ventricular predominance. The final stage

is that of congestive cardiac failure with generalized œdema. The spleen is not enlarged in the majority of cases. Hare and Ross, while admitting syphilis as the most important etiological feature, find a small group in younger patients with no syphilitic antecedent.

Thrombo-angiitis Obliterans.—S. Silbert,⁵ from a study of 289 patients, 225 of whom had typical thrombo-angiitis obliterans, and 64 per cent of whom had an amputation of one extremity, finds that a large majority are improved by intravenous injections of **Hypertonic Salt Solution**. The method in his hands appears to be safe, and no fatalities or serious risks have been observed, though temporary jaundice occurred in a few instances. The most important contributing factor in the disease appears to be smoking, and cessation of this habit is an essential therapeutic measure. He is inclined to the view that most of the failures are due to the refusal to follow advice in this matter. The details of injections are not given. As contra-indications the author gives an age of over 60 and an injured myocardium.

REFERENCES.—¹*Pressé méd.* 1929, Dec. 14, 163; ²*Ibid.* 1930, Feb. 12, 217; ³*Lancet*, 1929, ii, 756; ⁴*Ibid.* 806; ⁵*Jour. Amer. Med. Assoc.* 1930, May 31, 1730.

ARTHRITIS. (*See* BLOOD- AND LYMPH-VESSELS; RHEUMATISM AND ARTHRITIS.)

ASBESTOSIS, PULMONARY. (*See also* INDUSTRIAL DISEASES.)

W. H. Wynn, M.D., F.R.C.P.

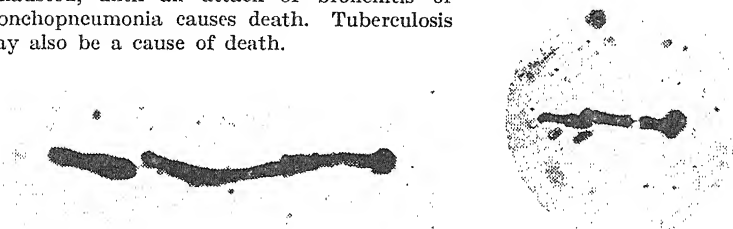
W. Burton Wood and S. R. Gloyne¹ have examined 37 cases of this disease. The cardinal symptoms are dyspnœa and cough. The former is often the first symptom, the patient complaining of slight breathlessness on hurrying or going up stairs, or that the chest 'feels stuffy'. In late cases the dyspnœa may be extreme, the slightest exertion giving rise to laboured breathing. Cough is seldom severe, and may be absent for long periods; sputum is absent or scanty; there may be occasional streaks of blood. Anorexia, lassitude, pains in the chest, and loss of weight are other symptoms; wasting is progressive and may be extreme. When the disease is established the skin has a leaden hue; cyanosis may be absent or slight. The chest expansion is poor, and may be reduced to one inch or less. Clubbing is seldom marked. Corns due to irritation of asbestos fibres may occur on the hands and on the legs of girl workers. The signs in the lungs are those of fibrosis limited to or predominating in the lung bases; dry crackles are heard and sometimes a pleural rub. As the fibrosis is bilateral the heart is not displaced.

Asbestosis bodies can be demonstrated in the sputum by M. T. Stewart's² technique. The sputum is mixed with an equal quantity of concentrated antiformin and allowed to stand. It is centrifuged, the supernatant fluid pipetted off, and a film examined with a $\frac{1}{8}$ -in. objective. Asbestos fibres, but not asbestosis bodies, have been found in the mouth and nasal secretion.

When the patient's occupation is known diagnosis should not be difficult except in the earliest stages. The history of cough and dyspnœa, the signs of bilateral pulmonary fibrosis, the situation and quality of the râles, the radiological appearances, and the presence of asbestosis bodies in the sputum are distinctive. In the early stages diagnosis may be impossible. An uncomplicated case should not be mistaken for tuberculosis, but tuberculosis may supervene upon the damaged lungs. In advanced cases the radiological appearances are characteristic. The picture is that of a fine fibrosis affecting the lower half or two-thirds of the lung fields. At first sight the affected areas may exhibit a diffuse haze resembling ground glass. Closer inspection reveals areas of fine mottling and linear shadows, which towards the base may be

draped like coarse cobwebs. The heavy granular shadows of other pneumoconioses are absent. The costal angles are obliterated. The lateral margins of the lungs may show thickening of the parietal pleura, and the dome of the diaphragm is obscured. These are the advanced appearances, and all gradations may be found between these and the first fine mottlings and striations of early mischief.

A. C. Haddow³ has studied four fatal cases, the average age at death being 41; the average years spent in the factory were under twenty. Onset of symptoms seems to have occurred after about five years' exposure. The condition was usually found during an attack of influenza or winter cold, when an exacerbation might occur. During the summer symptoms abate. Patients may live for several years after they have become incapacitated for work, but grow progressively weaker and more emaciated, sleepless, and exhausted, until an attack of bronchitis or bronchopneumonia causes death. Tuberculosis may also be a cause of death.



Figs. 3, 4.—'Curious bodies' showing the colloidal aggregates separated, mechanically, from the slender filaments of asbestos fibre on which they are adsorbed. ($\times 400$.)



Figs. 5-7.—'Curious bodies', the nuclei of which consist of spicules of biotite. ($\times 400$.)
(Figs. 3-7 by kind permission of the 'British Medical Journal'.)

W. E. Cooke¹ has studied the characters of asbestos dust and the curious asbestosis bodies found in the lungs (Figs 3-7). There are many varieties of asbestos, but he deals only with Chrysotile. The dust generated during the process of manufacture consists of fragments of fibre and translucent spicules split off from it. The spicules vary in length and thickness, some being ultra-microscopic. The dust contains also black, brown, and blue fragments. The colourless and the brown and blue particles are refractile by polarized light. The black particles do not transmit light, and consist of biotite and magnetite. The iron-containing minerals are responsible for the varying amount of iron in different specimens of asbestos, and the dust containing the greater number of black particles has the greater iron content. Chrysotile contains 2.81 per cent of iron, but the dust from the carding-room contains 18.4 per cent. Sections of lung and the results of digestion of the lung with trypsin show an enormous amount of fine black granular dust, much of which is carbonaceous. In addition there are two striking features. The first is the almost complete

absence of the very fine translucent spicules of fibre, and the second is the presence of very large fragments found in fibrotic and necrotic areas singly or in groups. They are so large that some must occlude small bronchioles. These fragments are identical with those found in the dust. In addition the lungs show curious bodies found in the alveoli, bronchioles, fibrotic and necrotic areas, and in phagocytes. The larger bodies measure 20μ to 100μ in length, are of a golden-brown colour and of various shapes. They may have single clubbed ends, appear as dumb-bells, filaments, or like a series of discs. Sometimes they have a superficial resemblance to minute crustacea. The bodies do not stain with aniline dyes, but give the reaction for iron in varying degrees of intensity. They have been found in every autopsy on pulmonary asbestosis. Investigation has shown that these bodies consist of central nuclei of asbestos spicules upon which colloidal aggregates of blood proteins, plus possibly soluble fragments of asbestos and an iron salt, have been absorbed and moulded by currents in the bronchi and alveoli. Wood and Gloyne have shown that when acted upon by concentrated sulphuric acid the highly refractile asbestos fibre which forms the core can easily be seen. Once seen the asbestosis bodies can be readily recognized and cannot be confused with any other substance found in human histology. These authors classify cases into three stages: (1) The presence of asbestos fibres in the nasal secretion or mouth, indicating exposure but not necessarily disease; (2) The presence of asbestosis bodies, which is a sign of tissue reaction and of disease; (3) The typical symptoms, signs, and X-ray appearances, which are, in addition, clear evidence of the disease irrespective of the finding of asbestosis bodies.

Symptomatic treatment is disappointing as there are no means of relieving the dyspnoea, and once the asbestosis bodies appear in the sputum the course is progressively downwards. Nor does cessation of exposure to the dust avail to check its advance. Prophylaxis is all-important, and the hope for the future of the asbestos worker is to be found in the adoption of proper means of protection.

REFERENCES.—¹*Lancet*, 1930, i, 445; ²*Brit. Med. Jour.* 1929, ii, 581; ³*Ibid.* 580; ⁴*Ibid.* 578.

ASTHMA IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

G. W. Bray,¹ working at the Asthma Clinic at the Hospital for Sick Children, Great Ormond Street, has published his observations on 200 cases of asthma in children; and although his paper includes a good deal which is already familiar, there is much that is of great interest and suggestive of future advance in this difficult subject.

Age Incidence.—As is well recognized, about one-third of all cases of asthma have their onset during the first ten years of life. In those cases arising in the first decade, no less than a quarter arise in the first year of life according to Bray's figures. Very rarely asthma may date even from birth.

Sex Incidence.—In the present series boys were affected three times as often as girls. The preponderance of asthma in boys is the rule according to most authorities, but not all give quite such a great difference between the two sexes as this. Bray also found a 3 to 1 preponderance of males in infantile eczema, of whom one-quarter will develop asthma about their fourth year.

Hereditary Predisposition.—The author found a family history of allergy (asthma, hay fever, eczema, nettlerash, and migraine) was present in 70 per cent of cases of asthma in children: in 50 per cent unilateral, and in 20 per cent bilateral. Transmission appears to occur twice as often through the female as through the male.

Onset.—The earliest symptoms which properly interpreted show the allergic

tendency are frequently missed or ignored. This is demonstrated by the fact that children were rarely referred to the special clinic before their fifth year, yet symptoms could be traced back to a far earlier age.

Allergic Symptoms in Childhood.—Bray arranges the protean symptoms of allergy in children into six groups: (1) Skin: eczema, urticaria, pruritus, angioneurotic oedema. Ichthyosis is occasional. (2) Upper respiratory tract: chiefly recurrent colds and sneezing attacks. (3) Lower respiratory tracts: recurrent coughs and bronchial catarrh. (4) Alimentary: food idiosyncrasies, mucous diarrhoea, train sickness. (5) Nervous system: general nervousness, which Bray regards as a symptom of allergy and not a cause. (6) Urinary: frequency, straining, and enuresis.

The common articles giving clinical and skin reactions may be grouped as foods (fish, meat, milk, egg, wheat, oats, and potatoes) and inhalants (feathers, animal hair). In infancy the food reactions are common and the reactions to inhalants are rare: in children over ten years of age it is rare to find positive food reactions, practically all reactions being to inhalants.

Types of Asthma.—These may be classed as follows: (1) Acute bronchitic type of infancy. This simulates a bronchitis, except that its onset and offset may be characteristically sudden. Sneezing may be common, but little is seen of bronchial spasm. (2) Asthmatic bronchitis of the kindergarten age, a recurrent 'bronchitis'. (3) Bronchial asthma of the adult type frequently seen in children over five years of age. The attack may terminate suddenly, often by vomiting a large amount of mucus; or catarrhal sounds may remain about the lungs for weeks. Relapses are common. (4) Coryzal asthma (hay asthma). This consists of conjunctivitis, itching of eyes and nose, watery nasal discharge, sneezing, and lachrimation. It is uncommon before four years of age. (5) Eczema-asthma-prurigo syndrome: chiefly consisting of nocturnal itching which gives rise to eczema. Asthma develops later.

The Nose and Throat in Asthmatic Children.—In the author's opinion the removal of infected tonsils and adenoids seldom gives rise to more than temporary improvement. Some children assign the onset of asthma to the operation. On the other hand, it is useless to endeavour to cure any case of asthma in a child with enlarged tonsils and adenoids. Sinus disease Bray does not regard as common.

Hypochlorhydria.—The most novel point brought out in Bray's work is to the effect that three out of every four cases of asthma in children show a hypochlorhydria on fractional gastric analysis, and he states that this group responds well to **Acid Therapy**. Further observations and details of this are promised and will be awaited with interest. It is very widely recognized that many asthmatic children have dyspepsia, usually of the atonic type, but it is, I think, news that hypochlorhydria is so common as mentioned above.

REFERENCE.—*Arch. of Dis. Child.* 1930, v, 237.

ASTHMA AND HAY FEVER. (See also NOSE, DISEASES OF.)

W. H. Wynn, M.D., F.R.C.P.

As a result of much active investigation along many lines, the problems of asthma are becoming more clearly defined. Evidence of a special 'asthmatic' constitution is to be found in a study of the hereditary factor. G. W. Bray¹ has investigated 200 consecutive cases of asthma under 12 years of age, and his paper is fully reviewed in the previous article. He considers the following to be established facts: (1) The allergic diathesis is transmitted as a Mendelian dominant; (2) The greater the heredity, the earlier are symptoms manifested; (3) The earlier in life the individual becomes sensitive, the greater the tendency

to multiple sensitization; (4) Asthma, hay fever, eczema, urticaria, angio-neurotic cedema, and migraine appear to be intimately correlated and to be interchangeable; (5) A child born in a family with a pure hay-fever lineage is much more likely to be affected with hay fever than with asthma, and vice versa; (6) Where several members of one family are affected, sensitization is not identical as regards the specific proteins, nor are the clinical types of allergy or the symptoms displayed in each type themselves identical in different members of the same family.

Accepting the fact that an inherited diathesis is present in most asthmatics, in what does the essential fault consist? The spasm of the bronchial muscles, swelling of the mucuous membrane, and hypersecretion, which to varying extents account for the paroxysm, can be brought about by stimulation of the vagus, and the conclusion is that in the last resort asthma is due to stimulation of the vagus fibres. A. F. Hurst² holds the view that there is a slight deviation from the average blood chemistry, which results in the vagal constituent of the bronchial nervous system being the predominant partner. In such individuals certain chemical, reflex, and psychical stimuli, which have no effect on normal individuals, give rise to spasm of the bronchial muscles together with congestion and hypersecretion—in other words, asthmatics are vagotonic. This theory readily explains the occurrence of asthma from reflex and psychical causes, but is difficult to reconcile with the allergic theory. Hurst apparently holds that hypersensitiveness to foreign proteins can only produce asthma in persons with the constitutional tendency, and that the proteins act by stimulating the vagus centre. But allergy seems to be something more fundamental than merely one among several factors which may stimulate the vagus. Is the vagotonic person more apt to become allergic or is vagotonia a manifestation of allergy? R. J. S. McDowall³ has shown that the introduction of some form of protein into some animals causes a greatly increased sensitivity of the vagus. If peptone is injected into the blood-stream, the slowing of the heart and the constriction of the bronchi caused by pilocarpine is enormously enhanced. Foreign proteins may also act directly on the bronchi (or the neuromuscular terminations of the vagus) in some cases, as shown by the fact that if the lungs of a sensitized guinea-pig are freed from all nervous connections and then perfused with a solution of the protein to which the animal is sensitized, a tight constriction of the bronchi will result. The cutaneous reactions or the response of the nasal mucous membrane to pollen cannot be essentially different from the response in the bronchi, and with these it is unnecessary to consider vagus action. On the other hand, the instability produced by proteins is general to the whole autonomic nervous system, including the peripheral vessels, and the cutaneous reactions given by proteins are apparently associated with hyperexcitability of a local nervous mechanism, since they are not obtained if the skin is cocaineized. Vagotonia and allergy may therefore prove to be merely different aspects of the one fundamental condition.

G. H. Oriel,⁴ on biochemical grounds, finds that asthmatics fall into more than one group. He contrasts two types. In the first, asthma begins in infancy, and to begin with is associated with eczema, which later is replaced by prurigo. Later, cyclical vomiting or migraine may occur. In this group the blood shows a low blood-sugar, a positive indirect van den Bergh reaction, and a raised amino-acid content. In a larger group asthma begins after some local lesion of the lung such as whooping-cough, bronchitis, or pneumonia, and the onset is often at puberty or the climacteric. Blood-sugar is low, but the van den Bergh reaction negative and amino-acid low. The author points out that from a biochemical point of view the outstanding feature in asthma

is instability. There is a switching over from acidosis to alkalosis, with corresponding urinary changes. Ketosis is easily produced and sugar is easily exhausted.

J. Alexander⁵ distinguishes true bronchial asthma from asthmatic bronchitis. In true asthma there is a frequent family and personal history of asthma or other allergic manifestations, the age of onset is in the earlier years, the attacks are paroxysmal, and in the intervals there is freedom from signs and symptoms. Cough and sputum only occur as the paroxysm passes off. The sputum and blood contain an increase of eosinophils. Skin reactions are given by about one-half the cases, and the attacks are relieved by **Adrenalin**. After a time bronchitis and emphysema complicate the picture. Asthmatic bronchitis is an expression of a severe bronchitis. There are no family or personal history of allergic phenomena, no skin reactions, and no eosinophilia. Cough and sputum precede and accompany the attacks. Adrenalin may partially relieve the wheezing, but has not the same striking effect as in true asthma.

F. A. Knott⁶ finds on examination of the sputum that the eosinophil cells tend to be concentrated in the plugs and spirals, and that the eosinophilia of the blood corresponds closely in degree to that in the sputum and is evidently a measure of the local allergic reaction. The frequency of the eosinophil cells is the same in cases with allergic complications and those with pure asthma. Eosinophilia cannot be taken as evidence of a particular type of asthma—namely, that due to sensitization to external proteins—but simply indicates the presence of true asthma. Bacteriological examination of the sputum showed that no one type of organism was especially prevalent in asthmatics, except possibly certain Gram-negative bacilli. These bacilli fall into two groups—one identical with or related to *B. Friedländer*, and the other resembling influenza bacilli. Positive cutaneous reactions are more likely to be obtained with these bacilli than with micrococci, and a vaccine of the bacilli is more likely to cause reactions and to be therapeutically successful. Most of the cases, from which these Gram-negative bacilli were isolated were of the purely asthmatic type, as contrasted with those with allergic complications.

K. D. Figley⁷ adds yet another to the list of inhaled proteins which may cause asthma, as he has had four cases due to mayflies. The patients lived on the shores of Lake Erie, and their asthma coincided exactly with the mayfly rise. Skin tests with an extract from the flies were positive. The asthma was caused by the inhalation of minute particles of the shed pellicle of the insects. One case was successfully treated with an extract made from the dried flies.

TREATMENT.—The work of A. A. Osman⁸ and of H. C. Cameron⁹ has shown that **Glucose** is of benefit during an attack of cyclical vomiting and as a prophylactic measure. Oriel confirms their observations that it is equally useful in other allergic conditions, especially in children. Two ounces of glucose are taken, dissolved in a little lemon water, on rising and on retiring to bed. A teaspoonful of **Sal Volatile** in half a tumblerful of water is taken before the midday and evening meals in addition. The results in the treatment of cases with allergic complications have been gratifying. Glucose may act by increasing the detoxicating power of the liver, and ammonia by facilitating the conversion of amino-acids into urea.

J. Freeman¹⁰ describes his method of '**Rush**' **Inoculation**, which has been used for desensitization to animal asthmas, food sensitizations, and especially for hay-fever cases. The usual method—for example, for hay fever—is to begin treatment in February or March and to inject gradually increasing doses

once a week until the hay-fever season begins. Later an intensive method for desensitizing animal-sensitive patients was adopted. Patients were injected every day with gradually increasing doses (10 to 20 per cent increases). This proved successful and convenient. The anti-anaphylaxis method of Besredka suggested a still quicker desensitization. The injections are given every hour and a half to two hours throughout a fourteen-hour day. Thus a satisfactory course can be put through in two to four days. A safe initial dose is estimated by the intensity of the skin reaction. It may be 20 to 100 units of, say, pollen. An increase of 10 to 20 per cent on the preceding dose is made at each inoculation if this can be borne without discomfort. If there is a reaction, the percentage increase is slowed down or a smaller dose given. As the doses increase in geometrical progression it only takes a few days for a dose of, say, 100 units to mount to perhaps 20,000 units. This method has the great advantage of being time-saving and convenient. It is, of course, necessary to make sure of the specific diagnosis and that sensitization is to one foreign protein only, or, if there is multiple sensitization, that the other sensitization will not interfere with the success of treatment. For example, it is courting failure to desensitize a hay-fever subject with grass pollen only if he is also sensitive to a bacterial infection or to mould spores in his house.

J. Maxwell¹¹ has found **Tuberculin** treatment of value in a considerable number of cases which proved resistant to other methods. It can be used in spasmodic asthma at any age. To ensure success the course must be prolonged. Decimal dilutions of old tuberculin were used, ranging from 1-1,000,000 to 1-100. An intradermal test was first performed, and the size of the initial dose was decided on the result of the test. With very marked reactions the initial dose was 0.1 c.c. of the 1-1,000,000 dilution, with weaker reactions the 1-100,000 or 1-10,000 dilution was used. Injections were given weekly at first, and the doses gradually increased, care being taken to avoid local reactions. When the 1-1000 dilution was reached, injections were given every two weeks until 0.5 c.c. of this dilution was reached. This dose was repeated at monthly intervals as often as necessary. The results recorded compare favourably with other methods and appear to justify a more general trial of this treatment.

H. Beckman¹² advocates the use of **Nitrohydrochloric Acid** for hay fever. A dose of 10 min. of nitrohydrochloric acid (not the dilute) is given well diluted with water after each meal and at bedtime during the hay-fever season. In a group of 185 hay-fever patients treated by twenty-six physicians 66 per cent obtained marked or complete relief. He believes that the allergic individual is in a state of relative alkalosis.

REFERENCES.—¹*Brit. Med. Jour.* 1930, i, 1138; ²*Ibid.* 1929, ii, 839; ³*Practitioner*, 1930, Feb., 212; ⁴*Guy's Hosp. Rep.* 1929, Oct., 480; ⁵*Bronchial Asthma*, Minor Monograph series; ⁶*Guy's Hosp. Rep.* 1929, Oct., 491; ⁷*Amer. Jour. Med. Sci.* 1929, Sept., 338; ⁸*Guy's Hosp. Rep.* 1927, lxxvii, 425; *Brit. Med. Jour.* 1929, i, 150; ⁹*Brit. Med. Jour.* 1929, i, 185; ¹⁰*Lancet*, 1930, i, 744; ¹¹*Brit. Med. Jour.* 1930, i, 854; ¹²*Med. Jour. and Record*, 1929, July 3, 9.

AUDITORY IMPERCEPTION, CONGENITAL (Congenital Word-Deafness).

Macdonald Critchley, M.D.

Increasing interest has been paid during the past few years to the problems of backwardness in speaking and particularly to its relationship with congenital 'word-deafness'. Although the condition has hitherto been regarded as exquisitely rare, there is evidence that it may be of greater frequency than suspected, and that many children labelled as imbecile, 'backward in speech', or aphasic may belong to this group.

The beginning of our knowledge dates from such isolated case-reports as

those of Benedikt (1865), Hun¹ (1868), and Coen² (1889). In 1891 appeared the well-known paper of Hale White and Golding Bird³ wherein were described two brothers who spoke a language of their own, to which the term 'idioglossia' was first applied. Kerr,⁴ in 1900, was the first to use the term 'congenital word-deafness' in the description of a boy of normal intelligence and hearing who was unable to understand spoken words. Other papers followed, notably those of Guthrie,⁵ Thomas,⁶ Yearsley,⁷ Town,⁸ Burr,⁹ and Variot.¹⁰ During the past two years a series of papers has appeared by C. Worster-Drought and I. M. Allen¹¹ dealing with the detailed investigation of a personal case, and a comprehensive survey of the whole problem. The authors propose the term 'congenital auditory imperception' as expressing more accurately the full and intrinsic nature of the disability. A further contribution has been made by A. G. Morison.¹²

The outstanding clinical features as given by Worster-Drought and Allen may be enumerated as follows: Males are affected more often than females in the proportion of 5:1. A familial factor has been demonstrated in over one-third of the cases on record. The essential nature of the defect comprises a lack of comprehension of spoken words in the absence of deafness or intellectual inferiority. The defect dates from birth. Spoken language, however, may be understood when articulated in the patient's sight owing to the facility with which the child learns lip-reading. At times the patient may be able to repeat a few short sounds or words heard. Sometimes he fails to understand and appreciate musical sounds, and sometimes even cruder noises. Spontaneous speech is absent or exceedingly defective; if present at all, it is acquired extremely late. Its nature is usually described under the term 'idioglossia'. In some cases at least there is a difficulty in comprehension of written or printed symbols; attempts at writing are defective, often revealing the same errors as are present in the speech. Writing from dictation is, of course, impossible so long as the speaker is out of sight. The intellectual status is potentially normal, although the defect produces an impression of feeble-mindedness. Under the curb of a defective environment and education, however, the patients may deteriorate into imbecility, often with anti-social trends.

The nature and pathogenesis of congenital auditory imperception are still conjectural. So far there has been no pathological study available. An association with congenital word-blindness at once arises, and an analogous basis has been surmised in a cortical aplasia localized to certain neuronic complexes. The work of Ewing,¹³ however, raises another avenue of speculation. In a series of children who were under special care on account of backwardness in speaking and presumed deafness, there were included a number of very heterogeneous types. Some of them probably belong to the group of auditory imperception. By the use of an audiometer it was found that some of the children were deaf to tones of high frequency. The probable effect of this defect would be to render the perception of spoken language highly imperfect, so that vowel sounds would be confused. Spoken sounds, under such circumstances, would appear largely distorted, and would lead to a highly imperfect enunciation. In such circumstances the child would probably abandon the attempt to follow spoken sounds or to make himself understood by words. The difficulty is analogous to that of a slightly deaf individual visiting a foreign country where the language is largely unfamiliar. Thus a peripheral factor, rather than a central one, may be the basis of what we term congenital word-deafness. It will be important, therefore, to test all such suspected children, not only as to the presence or otherwise of hearing, but as to the appreciation of high versus low tones.

REFERENCES.—¹*Monthly Jour. Psychol. Med.* 1868; ²*Zeits. f. Schulgesund.* 1889, 412; ³*Med.-Chir. Trans.* 1891, lxxiv, 181; ⁴*Brit. Med. Jour.* 1900, i, 1231; ⁵*Functional Nervous Disorders in Children*, London, 1907; ⁶*Public Health*, 1908, xxi, 90; ⁷*Proc. Roy. Soc. Med.* 1909, ii, 137; ⁸*Psychol. Clinic*, 1911-12, v, 167; ⁹*Pediatrics*, 1912, xxiv, 137; ¹⁰*Bull. Soc. Péd. de Paris*, 1913, xv, 239; ¹¹*Jour. Neurol. and Psychopathol.* 1920, ix, 193, 289; x, 193; ¹²*Ibid.* 1930, xi, 28; ¹³*Aphasia in Children*, London, 1930.

AURICULAR FIBRILLATION. (See ARRHYTHMIA.)

AYERZA'S DISEASE. (See ARTERIES, DISEASES OF.)

BACILLARY DYSENTERY. (See DYSENTERY, BACILLARY.)

BACK, INJURIES TO. (See MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

BERI-BERI.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The conclusions derived from two years' research in Hong-Kong on 600 cases of beri-beri, with 80 post-mortems as well as animal experiments, are recorded by A. Cannon,¹ who considers the disease to be induced by three factors—namely, water-soluble vitamin B deficiency, the *B. asthenogenes* of Bernard, and an endocrine disturbance. He also noted a low cholesterol content of the blood, a low blood-pressure, an excess of cerebrospinal fluid, and a capacity to take about twice the normal amount of sugar without its appearing in the urine. The bacillus can be isolated from the human blood by culture in an anaerobic medium of equal parts of bouillon and milk, and fixation of complement and agglutination can be performed with cultures heated to 45° C. Agglutination after five hours in dilutions above 1-150 is considered to be diagnostic. Enlargement of the heart is of diagnostic importance, and post mortem the right ventricle may be three times the size of the left and look fatty, all the tissues are cedematous, and acute parenchymatous nephritis may be present. He advises 150 grm. of **Magnesium Sulphate** in twenty-four half-hourly doses in the day for one to three days, $\frac{1}{2}$ c.c. of **Pituitary Extract** twice daily, and 1 c.c. of 5 per cent **Cholesterin** in olive oil hypodermically on alternate days up to six to ten doses, together with **Vitamin B**.

G. Verghese² has investigated samples of rice in Burma believed to have been the cause of beri-beri, and he supports the view of Megaw and of Acton that polishing of rice damages the grain and leads to its deterioration in a damp climate owing to invasion by bacteria, with the formation of toxins; so the number of diseased grains in a sample of rice is a measure of its unsuitness for human consumption.

R. McCarrison³ records the results of a comparative study of whole-wheat bread and white bread, and concludes that white bread, containing about 2 per cent of yeast, is inferior in nutritive value to whole-wheat-flour unleavened bread (Indian chapatti), as that amount of yeast does not make good the loss of vitamin B in white flour even when a fair amount of whole milk and abundant fresh vegetable foods are added. When fats form a good portion of the diet, abundance of vitamin B as well as of A is necessary for their utilization.

In view of Wenckebach's suggestion that *heart failure* in human beri-beri is due to œdema of the heart muscle, C. Newcomb⁴ has made chemical analyses of the heart muscle of pigeons after feeding on a vitamin-deficient rice and dal diet, from which he concludes that the large heart of beri-beri columbarum is not due to water retention. C. S. Keefer⁵ records a study of the beri-beri heart, in which he points out that the patients who develop cardiac insufficiency are those who have least involvement of the nervous system; this he

explains on the ground that nerve paralysis prevents the muscular exercise predisposing to cardiac dilatation. In a study of fifteen patients with cardiac insufficiency all showed enlargement of the right side of the heart, which decreased rapidly with proper treatment with vitamins. Dilatation of the pulmonary artery and of the superior vena cava was noted, but the blood-pressure was variable, no characteristic electrocardiographic changes were found, and no evidence was obtained of paralysis of the vagus, but the heart changes are compatible with Alsmeier and Wenckebach's theory of œdema of the heart muscle being the cause of the cardiac failure resulting from vitamin-B deficiency.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 852; ²*Ind. Jour. Med. Research*, 1930, Jan., 929; ³*Ibid.* 667; ⁴*Ibid.* 721; ⁵*Arch. of Internal Med.* 1930, Jan., 1.

BILHARZIASIS. (*See* SCHISTOSOMIASIS.)

BIRTH CONTROL. (*See* PREGNANCY AND ITS DISORDERS.)

BLACKWATER FEVER. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

TREATMENT.—E. C. Cort¹ records the results of his treatment in two series of cases seen in Siam. The first consisted of 41 cases with a mortality of 20 per cent under symptomatic treatment, including **Quinine** when malarial parasites were present, **Atoxyl** or **Sodium Cacodylate**, and fluids by the bowel or subcutaneous injections. The second series consisted of 26 cases in which **Neo-arsphenamine** was given in addition by injection in a dose of 0.15 gm. every day for three days, followed by 0.3 gm. after three days, and then weekly for three or four weeks. **Alkalis** were also used in the second series, during which the writer's greater experience also told, all cases being given immediately on admission 500 c.c. of a 2 per cent sodium bicarbonate solution subcutaneously or intramuscularly and a similar amount of normal salt solution, and these two solutions were repeated alternately every three or four hours, while tepid sponging was used to control fever. In the first 41 cases 37 relapses occurred, but only 2 in the last 26; this he attributes to the neo-arsphenamine.

REFERENCE.—¹*Amer. Jour. Trop. Med.* 1929, Sept., 401.

BLADDER, SURGERY OF. *Sir John Thomson-Walker, F.R.C.S.*

Implantation of Ureters into the Rectum.—G. Grey Turner,¹ impressed by the success attending Stiles's method of implanting the ureters into the rectum, and the failures following early attempts at plastic repair of ectopic bladder, has written a detailed account of his experience in 17 personal cases of the treatment of congenital defects of the bladder and urethra by implantation of the ureters into the bowel (*Plate II*). His cases are described in detail and have been admirably followed up. The best age for the operation depends upon the size, development, and the general health of the child, but speaking generally the age of election is between 5 and 7 years. In this series of 17 cases there were 4 deaths directly due to the operation, a mortality of 23.5 per cent. Since most of the cases were dealt with in two stages, there were 28 separate operations, making the mortality 14.3 per cent. But if one takes the number of times the separate ureters have been transplanted—namely, 29 with 4 deaths—the mortality is reduced to 13.8 per cent. Three of the patients died from peritonitis; in the first of whom there was a sloughing of the ureter and an acute ascending pyelonephritis. In this case both ureters were transplanted at the same operation. In the second case peritonitis was due to a direct leak from the second ureter, which had become much dilated and which was found to have been perforated by a fixation stitch, while in

the third case death from peritonitis followed transplantation of the first ureter, and the infection had probably arisen from the neighbourhood of the abdominal incision. The fourth death after operation was that of a baby of 16 months who died of general septic dermatitis after transplantation of the first ureter.

Of the 13 who survived operations on the ureters, 1 has a urinary fistula following a plastic operation on the bladder; 1 remained well for two years and three months, then died after a plastic operation on the bladder; and 1 remained well for three years and three months, and then died of intestinal obstruction (*Plate III*). Ten patients have been cured, and their case records show that their general health is not far removed from the normal as judged by ordinary standards. The writer emphasizes the fact that it takes time for the system to become accustomed to the altered state set up by transplantation of the ureters, and it may be as long as two years before the condition of the patient can be said to have become stabilized. In the intervening period such patients are acquiring complete rectal toleration, and the kidneys are presumably accommodating themselves to the element of constant mild infection. It may be also that there is continuous absorption of urine from the bowel, and this may have some effect on the general nutrition and well-being. The writer therefore thinks that during this period it is wiser not to attempt any such operative interference as may be desirable for the removal of the bladder mucous membrane or other plastic procedures. The renal efficiency would appear to be lowered permanently, as judged by the blood-urea estimation and the urea content of the rectal evacuation. The technique of Stiles's operation is described in detail, and mention is made of alternative methods of ureteral transplantation, notably that of Coffey.

Rupture of the Bladder.—Fifty-five cases of rupture of the bladder are reported by M. F. Campbell.² Of these, 21 were extraperitoneal and 34 intraperitoneal ruptures; 9 of the former and 26 of the latter died. Nine intraperitoneal cases and one extraperitoneal were too ill for operative treatment. Of those submitted to operation—namely, 20 extraperitoneal and 25 intraperitoneal ruptures—8 of the former and 17 of the latter died. In view of the grave condition of most of these cases when first seen accurate pre-operative diagnosis is seldom possible. Six cases of this series were submitted to cystoscopy, and in only 4 could a view of the bladder wall be obtained. The writer mentions the use of pneumoradiography for diagnosis, but has no personal experience of the method. In one case there was rupture of a diverticulum of the bladder, and in 2 cases rupture of a chronically over-distended bladder due to prostatic enlargement occurred. In 20 cases the condition was associated with fracture of the pelvis. The two essentials for successful treatment are early operation and free drainage of the bladder with a large suprapubic tube.

Hernia of the Bladder.—C. Wakeley³ reports 40 cases of hernia of the bladder, a rare condition which very readily escapes recognition during operation for hernia; indeed, accidental injury to the bladder is often, even at the present day, the first indication of the condition. In the series in question, the bladder was injured in 3 cases, one terminating fatally. The condition is almost invariably inguinal or femoral, very exceptionally it is associated with perineal, obturator, or sciatic herniæ. Three varieties are described according to the relationship of the hernia of the bladder to the peritoneum: (1) Extraperitoneal, the rarest, but important to bear in mind as the bladder is likely to be injured through being mistaken for the hernial sac and opened. It always takes the form of a direct inguinal hernia, is of small size, and rarely gives rise to symptoms. In the writer's series one case only of this type was found in a consecutive series of 2500 cases of inguinal hernia coming to operation. (2) Paraperitoneal, in which the hernia may be direct or indirect and the bladder

PLATE II

IMPLANTATION OF URETERS INTO BOWEL

(G. GREY TURNER)



Fig. A.—Skiagram of pelvis from case of ectopia vesicae over three years after operation for implantation of ureters into bowel. The distance between the pubesis $2\frac{1}{4}$ in., and between the ischial spines $2\frac{5}{8}$ in. This boy has a distinctive gait, but plays games with his fellows and does not complain of weakness.

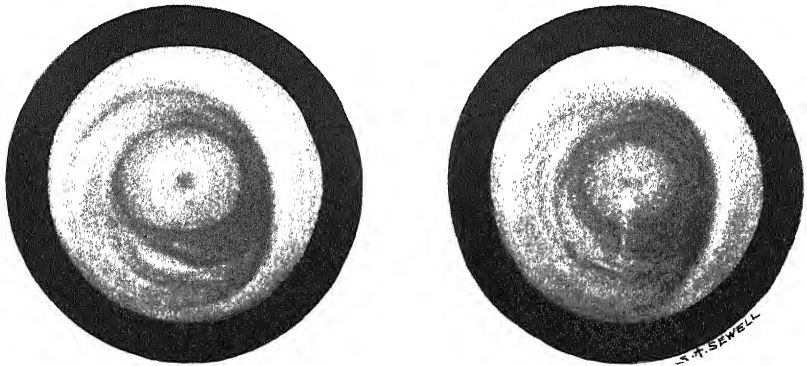


Fig. B.—The same case as *Fig. A*, showing the appearance of one of the ureteric orifices as seen by the sigmoidoscope: on the left at rest; on the right puckered and crenated during vermiculation and delivery of urine into the bowel.

Plates II and III by kind permission of the 'British Journal of Surgery'

PLATE III

IMPLANTATION OF URETERS INTO BOWEL—*continued*

(G. GREY TURNER)

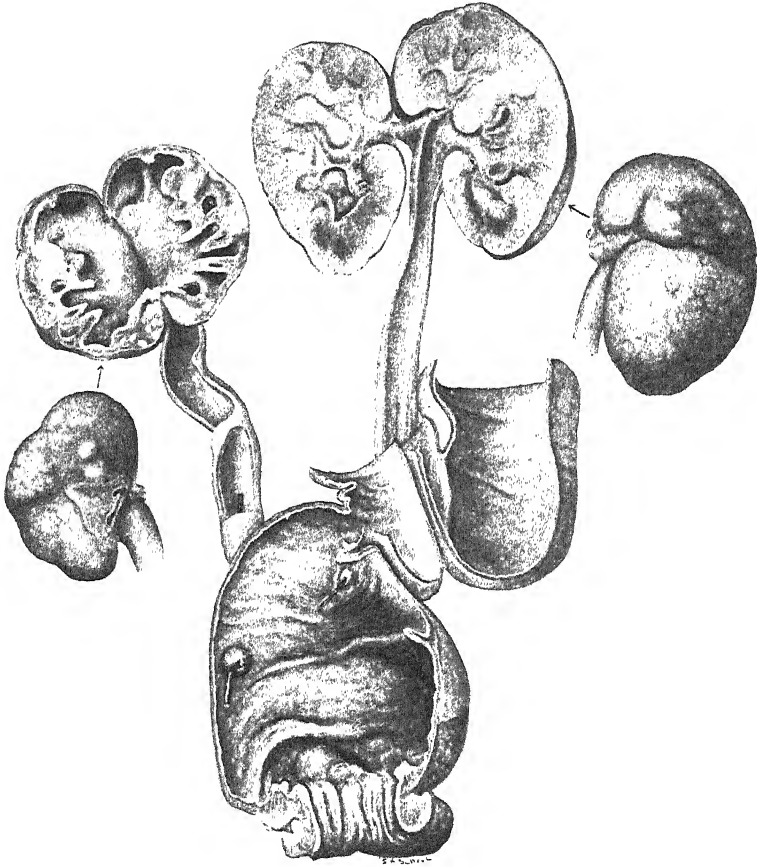


Fig. C.—The parts obtained after death from a patient with total episquias and incontinence, who died of intestinal obstruction 3 years and 3 months after implantation of both ureters. Intermediate health had been excellent. The right ureter is nearest the anus. The whole rectum is dilated, its wall is a little hypertrophied, and the mucous membrane is covered with an inflammatory exudate which gives it a roughened shaggy appearance. Above the level of the ureteric orifices the surface appears normal.

always lies on the inner side of the hernial sac and is quite outside it. This is the most common variety and the easiest to heal successfully. It occurred 25 times in the 40 cases reported. (3) Intraperitoneal, which occurred 14 times in the 40 cases. They practically always occur in the inguinal region, there is a complete hernial sac, and the upper and posterior part of the bladder enters the sac, which is external to the deep epigastric artery. The possibility of a diverticulum of the bladder constituting a hernial content must always be kept in mind. Hernia of the bladder is mainly an affection of adult life, but 4 cases occurred in patients under the age of 4 in the writer's series. Predisposing causes are urinary obstructions leading to increase in the volume of the bladder; age, leading to relaxation of the musculature of the abdominal wall; and traction exerted by the development of lipomatous conditions in the neighbourhood of the hernial orifices.

In comparatively few cases is pre-operative diagnosis made. When the condition is suspected cystoscopy is indicated before an operation for the cure of the hernia is performed. If due precaution is taken to free the peritoneal sac from the surrounding structures, with or without gauze dissection, injury to an associated bladder hernia should be a very rare accident. When a paraperitoneal hernia of the bladder is discovered during an operation, the treatment will vary according to the size of the bladder hernia and its relation to the sac. If the hernia is small it can be separated from the peritoneal sac by gauze dissection and invaginated into the abdomen, a purse-string suture being inserted through the floor of the inguinal canal to prevent recurrence. If, however, the peritoneal sac covers a considerable portion of the bladder, it should not be stripped off, but excision should be performed around the bladder attachment on the inside, but going up as high as the abdominal ring on the outside where the sac is quite free. The bladder is then invaginated and kept in place by a purse-string suture. Should, however, the floor of the inguinal canal prove to be too weak, and recurrence is expected, a flap from the anterior sheath of the rectus can be turned outwards and sutured to the internal oblique. After the bladder hernia has been dealt with a radical cure of the inguinal or femoral hernia is performed.

Catheterization in Post-operative Retention.—L. R. Kaufman,⁴ in order to determine the frequency with which catheterization is required for post-operative retention of urine, has reviewed 300 consecutive cases consisting of 100 general surgical cases, 100 gynaecological cases, and 100 obstetric cases. Catheterization was considered necessary in 15 of the first group, 23 of the second, and 13 of the last. Analysis of the figures showed that the incidence of post-operative retention was highest in the operations on pelvic and abdominal organs, varying from 18 per cent after hernia operations to 31 per cent after hysterectomy. Of 2 cases of resection of the Gasserian ganglion 1 required catheterization. The writer emphasizes the importance of early recognition of the condition and of not delaying unduly the use of the catheter in cases of post-operative retention of urine, in view of the evident discomfort to the patient and the serious menace of its complications.

Vesical Tumours.—D. W. MacKenzie⁵ reports a case of small round-celled sarcoma of the bladder occurring in a man of 54 whose symptoms were hæmaturia and pain in the back. On cystoscopy there was seen a large growth, showing areas of ulceration, situated on the roof of the bladder and extending down anteriorly almost to the internal urinary meatus. The ureteric orifices were normal in position and appearance and showed clear effluxes. Radiography was negative and general physical examination showed no evidence of metastases. Treatment consisted of extensive resection of the growth six days after the patient was first seen and about seven weeks after the onset of

symptoms. Seven months after operation local recurrence was noted in the bladder, and so far the patient is reported to be well four months after a second resection.

The writer summarizes the literature on the condition and finds that in this extremely rare disease metastases may occur in the regional lymph-glands, but remote metastases are late and uncommon. Wide radical **Excision** of the tumour is the treatment of choice, but early local recurrence is almost invariably the rule. A cure by either radium or X-ray treatment has not as yet been reported. The symptoms are not different from those of any other malignant tumour of the bladder, and operative results are extremely poor, death as a rule following shortly from continued hæmaturia or toxæmia.

Discussing *papilloma* of the bladder, J. B. MacAlpine⁶ states that the practical difficulties, and the uncertainty of the pathological diagnosis as to whether or not malignant changes have occurred, have led him to rely solely on clinical and cystoscopic data for the determination of this point. The longer and more delicate the villi, the more benign the growth. As a papilloma grows its villi become more stunted and swollen and the epithelium gets more granular and loses its lustre. Many growths when quite small show this coarser exterior and must already be regarded with misgiving. Finally surface necrosis appears, a feature which is indicative of malignancy; though when sepsis is present, as so often happens, it may be difficult to differentiate between ulceration and a film of mucopus adhering to the villi. The appearance of the pedicle should supply strong evidence with regard to the presence or absence of malignancy, but the pedicle may be hidden beneath the mass of the papilloma. It gets thicker, and in due course may equal the superstructure in breadth. A stiffening of the pedicle may be diagnosed by causing adhesion between the diathermy electrode and the neoplasm, whereupon gentle traction on the growth will indicate the degree of its mobility on the pedicle. The type of papilloma which is sessile over a wide area without much projection into the bladder is very suspicious, and if swollen mucosa or actual bullous oedema can be detected near the base it must be regarded as malignant. For papillomata which are undoubtedly benign as judged by cystoscopy there is unanimity as to the suitability of treatment by transurethral **Diathermy**, and there is almost equal accord that, if the papilloma has become malignant and is infiltrating the bladder wall, **Open Operation** must be employed. It is in the transition between these two types of cases that the difficulty lies. Once malignancy has supervened, diathermy must be abandoned. It cannot be expected that different surgeons will express identical interpretations regarding the individual members of these borderland types. This probably accounts for the wide discrepancies in the numbers of benign papillomata and malignant ones which make up the lists of different writers. Such discrepancies can only be explained by the different standards of the several investigators. When in doubt it may be wise to try the lesser measure of transurethral diathermy first. A simple tumour reacts thereto much more favourably than does a malignant one, and the result of treatment is helpful in forming an opinion. In view of the improvements in the technique of partial cystectomy the writer feels that if diathermy is not plainly succeeding, there should be no delay before adopting open operative treatment involving radical partial **Cystectomy**.

During the past ten years MacAlpine has seen 91 cases of papillomatous disease, in which series 6 have occurred in workers in aniline factories. Prior to the onset of the vesical neoplasm in these aniline workers there is a pre-monitory period in which the patient suffers from symptoms of cystitis. It is hardly necessary to emphasize the importance of cystoscopy during this prodromal stage. In addition to these 6 cases the writer has had the

advantage of studying the records of 9 other cases which have occurred in dye workers in Manchester since 1920. He concludes by discussing his methods of transurethral and operative treatment.

F. Hinman⁷ records his experience in the treatment of a series of 172 tumours of the bladder. He considers that, in practice, Broders' histological classification of tumours into four grades, on the basis of the degree of their malignancy as determined by observing the character of the cellular changes and mitotic activity, depends for its value on the correctness of the assumption that all cells of any one tumour will show the same grade of malignancy. That this is seldom, if ever, the case is an objection to placing confidence in such a classification. The only reliable guide to the choice of method of treatment that is of practical value is the information obtained by cystoscopic examination. A knowledge of the type, position, size, extent, and number of tumours in a bladder, irrespective of the exact pathological changes, is, Hinman considers, a safe foundation on which to outline a plan of treatment—namely, whether one shall employ diathermy, surgical measures, radium, or a combination of these methods. Unfortunately, however, it is not easy to ascertain the facts at the first cystoscopy, since bleeding may obscure the picture or smaller tumours may be hidden by larger ones lying in the foreground. A plan of treatment may have to be tentative, and a change in the method of treatment have to be contemplated should the result of the initial treatment be disappointing. Speaking generally, however, a cystoscopic picture, in conjunction with other clinical facts such as the history and physical findings, particularly those on rectal or vaginal palpation, estimation of renal function, and X-ray examination, is the first guide to treatment.

Edwin Beer⁸ writes an important article on **Total Cystectomy and Partial Prostatectomy** for *carcinoma* of the bladder. He selects for discussion a group of cases in which the trigone is so extensively involved that both ureters must be sacrificed. In addition many of these cases have extensive involvement of the bladder neck and the adjacent prostate. Four methods have, he states, been applied to this group of cases: (1) Suprapubic cystotomy, which is palliative and often fails to give relief. (2) Electrocoagulation through a suprapubic cystotomy wound, which is usually little more than palliative, from failure of penetration of the electrocoagulating current. (3) Introduction of radon seeds, the results of which are irregular, inconstant, and very rarely curative. This method has the additional disadvantage that it is followed by severe reaction and great discomfort, and often by cicatricial stenosis of the ureters. He does not discuss deep X-ray therapy. (4) As an alternative method Beer suggests total cystectomy with partial prostatectomy. The results of total cystectomy published are discouraging, and the figures of Scheele (1923) show an operation mortality of 53.5 per cent in single-stage operations and 30 per cent in two-stage operations. Numerous isolated cases and small groups of cases are recorded in the literature with a high mortality and little information in regard to late results. Of 12 cases operated on by Fedoroff, 8 died from the operation and only 2 were alive after two years. This subject was discussed in the *MEDICAL ANNUAL* of 1928 (p. 59).

The most important problem in total cystectomy is the question of deviation of the urine. M. Papin⁹ reviewed the whole subject and collected 181 total cystectomies. He found the mortality of cases where the ureters were implanted into the intestine was 59.2 per cent, into the vagina 50 per cent, into the urethra 100 per cent, and into the skin of the loin or iliac region 28.7 per cent. In Beer's experience implantation into the skin of the iliac regions is the most satisfactory method. This author operated on 8 cases, all by a one-stage operation. One case in which the ureters were implanted in the sigmoid died,

while 7 cases of skin implantation recovered. He removes the upper part of the prostate with the bladder and seminal vesicles, transfixing the prostate with heavy gut or silk sutures like the cervix in supravaginal hysterectomy. This appears to be the weak part of the operation, for spread of growth in the prostate must be difficult to define. The author occasionally implants radium seeds in the cut surface of the prostate, and adds that it may be necessary to make a separate perineal incision cut across the membranous urethra and remove the whole prostate. The ureters are freed and implanted through a stab puncture in the abdominal wall in each iliac fossa. A urinal is necessary to collect the urine from each ureteral orifice.

Beer admits that it would be a great advance if the ureters could be re-transplanted from the skin into the bowel at a later date, but he has not carried this out. It seems more likely that primary implantation into the bowel will be further developed since the success of this method in extroversion of the bladder has been steadily growing. (*See above*, p. 63, and MEDICAL ANNUAL, 1923, p. 509; 1930, p. 537.) Of Beer's 8 recorded cases, 1 died, a mortality of 12.5 per cent. Of the 7 survivors, one lived five years, one nine months, one two months. One was alive four years, one for one and half years, one seven months, and one six months after the operation. Beer concludes from his experience that the mortality of extraperitoneal removal of the bladder with the adjacent part of the prostate is not prohibitive and that the operation can be done in one stage; even if the patient has to wear an apparatus, he is relieved of his painful condition and is able to get about.

F. Kidd¹⁰ describes two personal cases of extensive carcinoma of the base of the bladder involving the ureteric orifices and the internal urinary meatus. In these cases, by means of the endotherm knife, he removed the growth together with a margin of healthy mucous membrane and bladder wall, and included in the same piece of tissue the prostate, seminal vesicles, and contiguous portions of the vasa deferentia. As the prostate and internal urinary meatus were reached the endotherm knife was discarded and the remainder of the excision performed with curved scissors. Reconstruction of the bladder was carried out as follows: Into each ureter was inserted a special implantation catheter made of toughened gum-elastic, and ranging from No. 7 to No. 14 Charrière. The ends of the catheters are open and flute-shaped, and for some inches are pierced by numerous lateral eyes. Below the last eye the catheter expands into a bulb half an inch long which carries two circular grooves, one at each extremity. The mouth of the ureter being held up by clips, the ureteric catheter is guided up the ureter until the bulb has just disappeared. Two ligatures of No. 0 or No. 1 catgut are then tied tightly round the ureter, each ligature sinking into one of the grooves on the bulb. The ligatures seal effectually the lymphatics of the ureters, thus closing the paths of ascending infection during the process of healing. The ligatures were left long for use at a later stage in the operation for the purpose of fixing the ureters. A long silver catheter was introduced through the urethra, and through this the ureteric catheters were drawn through the urethra and left emerging from the penis. The two ureteric stumps were now approximated to the severed posterior end of the urethra by means of the catgut ligatures that were used to fix them to the ureteric catheters. A flap consisting of what was left of the bladder wall was then drawn under the ureters and tightly sutured around them. The writer describes his operative technique and the after-treatment in detail; both cases made a satisfactory recovery.

H. Sugar¹¹ describes the surgical treatment of four cases of carcinoma of the bladder and one of vesical diverticulum in order to illustrate the advantage of **Voelcker's Operation** for extraperitonealization of the bladder as a

preliminary step to major operative procedures such as partial resection of the bladder for growth or diverticulum, and even for total cystectomy. The method consists in opening the peritoneum at the apex of the bladder and incising the membrane at its lower line of attachment to the bladder. The free edges of the peritoneum are then united and the bladder excluded from the peritoneal cavity. [It seems hardly necessary to designate this as 'Voelcker's operation'. The procedure is one which is adopted by every surgeon who undertakes extensive resections of the bladder, and particularly in cases where a growth is situated on the posterior wall. The multiplication of names of surgeons in describing surgical procedures is one of the banes of modern operative surgery.—J. T.-W.]

Vesical Calculi.—Ralph Thompson¹² records in detail the histories of 22 cases of stone in the bladder which were the only cases of this condition found in the post-mortem records of a total of 13,000 cases seen at Guy's Hospital. All but one occurred in males. In 2 cases death was due to wounding of the bladder during litholapaxy, and, commenting on this fact, the writer states that he would not attempt to crush stones that were multiple or hard, or in the presence of cystitis. To these contra-indications he would also add the presence of an enlarged prostate and marked sacculcation of the bladder. In 2 cases death occurred from peritonitis after injury to the peritoneum during suprapubic cystotomy. In one case injury of the rectum followed lateral lithotomy for a large stone.

New Method of Making Permanent Suprapubic Opening.—W. C. Morton¹³ describes a method for establishing permanent suprapubic drainage whereby he claims that the long wait for complete epithelialization of the track is rendered unnecessary. The prepuce is used as a tubular pedicle graft for lining the suprapubic track. Provision must be made for temporary bladder drainage during fixation of the graft. Details of an operation for this purpose are given.

REFERENCES.—¹*Brit. Jour. Surg.* 1929, July, 114; ²*Surg. Gynecol. and Obst.*, 1929, Oct., 540; ³*Brit. Jour. Urol.* 1930, March, 1; ⁴*Amer. Jour. Surg.* 1929, Dec., 785; ⁵*Brit. Jour. Urol.* 1929, Dec., 359; ⁶*Brit. Med. Jour.* 1929, ii, 794; ⁷*California and West. Med.* 1929, Aug., 116; ⁸*Ann. of Surg.* 1929, Nov., 864; ⁹*Jour. d'Urol.* 1925, xx, 388; ¹⁰*Brit. Jour. Urol.* 1929, Dec., 380; ¹¹*Surg. Gynecol. and Obst.* 1930, Jan., 69; ¹²*Guy's Hosp. Rep.* 1929, Oct., 437; ¹³*Lancet*, 1929, ii, 170.

BLASTOMYCOSIS. (See COCCIDIOIDAL GRANULOMA; SKIN, FUNGUS INFECTIONS OF.)

BLOOD, COAGULATION OF. (See PRE- AND POST-OPERATIVE TREATMENT.)

BLOOD- AND LYMPH-VESSELS, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Ligation of the Inferior Vena Cava.—P. del Pino and R. L. Masciotra¹ describe the case of a woman in the seventh month of pregnancy with a large hydronephrosis of the right kidney. During the course of the operation the inferior vena cava was injured. A segment of the vein was resected. The next day a premature foetus was delivered, and died twelve hours later. Except for slight phlebitis recovery was uneventful. This case shows that it is safe to ligate or resect the inferior vena cava, but ligation can only be performed below the renal veins. The only complication attributable in the case mentioned was the abortion.

Arteriovenous Fistula.—As would be expected, the blood-current is reversed and the blood-pressure raised to some extent in the veins. The walls of the veins become arterialized, and the blood-pressure in the arteries is raised

on the proximal and lowered on the distal side of the lesion, (*see* MEDICAL ANNUAL, 1916, p. 103). The knowledge that ligation of the main veins together with the arteries does not increase the risk of gangrene—in fact, lessens it—renders the radical operation for arterio-aneurysm more safe and certain. Palliative treatment is not to be recommended if operation is feasible. This was pointed out by Osler.

B. Brooks,² in discussing these questions, states that therapeutic venous obstruction finds its most valuable application in cases of sudden arterial occlusion. When as a result of trauma or in the course of an operation it becomes necessary to ligate a large artery, simultaneous ligation of the concomitant vein is always to be considered. When the popliteal or axillary artery is ligated, ligation of the accompanying vein is definitely indicated. Ligation of the common iliac artery is not an indication for ligation of the common iliac vein. Ligation of the vein need not be performed with all arterial ligations; it is only recommended in cases where gangrene is to be expected.

E. Holman³ stresses the fact that in the large arteriovenous aneurysm, dilatation of the heart and of the artery and vein proximal to the fistula invariably occurs. The dilatation may proceed to complete myocardial failure. Arteriovenous fistulae should therefore be eliminated, preferably by quadruple ligation of the artery and vein and excision of the fistula. After the operation, measures such as venesection may become necessary to relieve myocardial strain.

Thoracic and Lumbar Sympathetic Ganglionectomy in Peripheral Vascular Diseases.—A. W. Adson and G. E. Brown⁴ give a very complete account of the work carried out in the Mayo Clinic. The reviewer has recently seen some of these operations performed and some of the after-results. A new field of surgery is being widely explored with considerable success. The writers point out that it is highly important clearly to define the types of vascular diseases that may be benefited by operations producing arterial dilatation.

Primary diseases of the arteries of the extremities can be classified in two main groups: (1) Functional, of which there are two types—(a) vasoconstrictor disturbances (Raynaud's disease), and (b) vasodilator disturbances (erythromelalgia); (2) Organic diseases of the arteries (thrombo-angiitis obliterans and arteriosclerosis). Vasoconstrictor disturbances should be permanently relieved by thoracic or lumbar sympathetic ganglionectomy, e.g., Raynaud's disease. In organic disturbances causing occlusive disease of distal arteries, there may be in addition to the occlusion of the main arterial channels an abnormal degree of vasospasm of the collateral vessels. Where there is a large element of spasm the operation of sympathetic ganglionectomy is beneficial. The results of operation in Raynaud's disease leave nothing to be desired. In every case the results were complete and permanent. For thrombo-angiitis obliterans, sympathetic ganglionectomy has not been so successful as in the case of Raynaud's disease, but the results more than justified the operative procedure. The relief from pain has been striking. The communication of Adson and Brown is summarized as follows: Sympathetic ganglionectomy and trunk resection is a surgical procedure of considerable magnitude. The operation is justified in advanced cases of Raynaud's disease, in the early developing vasospastic cases of scleroderma, and in cases of thrombo-angiitis obliterans in which vasospasm is present in the collateral arteries.

Interest is added to the whole subject of sympathetic ganglionectomy by a paper by L. G. Rowntree and A. W. Adson⁵ which describes a case of polyarthritis of the lower extremities in a young woman treated successfully by this operation. In a summary of a very detailed communication they state that the results observed in the case reported following sympathetic ganglion-

ectomy and ramisectomy reveal the fact that in certain types of arthritis the sympathetic nervous system of the extremities is hyperactive, producing a marked vasomotor disturbance and profuse sweating, and possibly contributing to the spasm and atrophy of the muscles with the resultant deformities. The clinical picture is characterized by coldness of the extremities, marked sweating, tender, painful, and swollen joints, and trophic changes in the muscles, skin, and nails. In their case all these abnormal manifestations disappeared on release of the extremities from sympathetic control. The relief in the lower extremities was complete, lasting over a period of almost three years. Similar results were obtained in both hands following cervicothoracic sympathetic ganglionectomy, but there were still some slight residual manifestations of arthritis, slight pain, and limitation of movement in both wrists. The lapse of further time and more cases are essential, of course, to a final evaluation of the effects of sympathetic ganglionectomy in this form of arthritis. But to date the results, both objective and subjective, have been most satisfactory in this case. Speculation concerning the mechanism of recovery is purposely omitted at this time. In the types of arthritis associated with marked bony changes, sympathetic ganglionectomy may be of little if any value; but in view of our obvious ignorance of the rôle of the sympathetic nerves in arthritis, its potentialities, even in this field, should be determined. In determining the value and limitations of sympathetic ganglionectomy in arthritis, the intelligent selection of cases obviously is a factor that is of paramount importance.

Embolism.—A. W. Allen⁶ states that approximately 30 per cent of all reported cases treated by operation have proved successful. In about half the cases reviewed by Allen the emboli occurred in patients with heart disease. The greatest aid in localization of the emboli is a knowledge of the fact that emboli nearly always occur at a bifurcation. If seen early, before secondary thrombus formation is too extensive, the site of the embolus can usually be determined. If it is in the popliteal artery, the femoral can be felt pulsating in Hunter's canal. If it is at the bifurcation of the common femoral, the lowest point of pulsation is just below Poupart's ligament. Voluntary ankle and toe motion is abolished. If the embolus has come to rest at the bifurcation of the common iliac, the whole thigh is cold, no pulsation is felt on that side, and voluntary knee motion may be abolished. At the bifurcations of the brachial and femoral arteries the embolus may be palpable. Seven very interesting cases are mentioned in Allen's paper.

Technique of Operation.—Operation should⁶ always be carried out under local or spinal anaesthesia. A liberal incision should be made to expose the artery above and below the embolus. A piece of tubing, the same calibre as the artery, is placed beneath the two branches distal to the embolus and above on the main trunk. These act as tractors, but are left slack except when needed. The wound should be protected by gauze saturated with 2 per cent **Sodium Citrate** solution, and instruments and gloves frequently washed in the same liquid. The artery is opened longitudinally and the embolus milked out by gentle pressure on the artery from below. It may be necessary to loosen the embolus with the aid of a probe. The incision in the artery is closed by very fine silk with an artery needle, both of which have been immersed in sterile oil. A running mattress or shoemaker's stitch may be used. If the site of the embolus is the bifurcation of the common iliac artery or the abdominal aorta, a retrograde removal through incisions in one or both femoral arteries is more successful than a direct abdominal approach.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, Jan., 44; ²*Ibid.*; ³*Ibid.* 1929, Sept., 251; ⁴*Jour. Amer. Med. Assoc.* 1930, Jan. 25, 250; ⁵*Ibid.* 1929, July 20, 179; ⁶*New Eng. Jour. Med.* 1929, Aug. 15, 304.

BLOOD TRANSFUSION. (See PRE- AND POST-OPERATIVE TREATMENT.)**BLOOD-PRESSURE, CONTINUOUS REGISTRATION OF.***A. G. Gibson, M.D., F.R.C.P.*

F. L. Golla and S. Antonovitch¹ describe a method by which the blood-pressure in man may be continuously registered. A small pressure-bag is firmly strapped over the dorsalis pedis artery and its pulsations are transferred through the sphygmographic tambour of Pachon and registered by a mirror on sensitized paper. By a method of previous calibration the actual pressure at any point in the tracing may be estimated. The method ought to be of service in investigating blood-pressure changes in disease.

REFERENCE.—¹*Quart. Jour. Med.* 1930, Jan., 167.

BLOOD-PRESSURE, HIGH.*A. G. Gibson, M.D., F.R.C.P.*

Most practitioners in the habit of regularly taking blood-pressures are aware of the great variability in the readings which may be found in the same patient. Clifford Allbutt once made the statement that in a nervous person the true pressure cannot be ascertained except after an interval of at least a quarter of an hour. In the experimental animal we know that variations occur with respiration and longer phasic variations due to alterations in the tone of the muscles of the arterioles, and such evidence as can be observed in man—for instance, with the Erlanger sphygmomanometer—show that similar variations are present. H. S. Diehl and H. D. Lees¹ made an investigation of 100 young men entering a university, unselected except that they were all presumably in good health, and they have recorded their observations by stating the variations above and below the mean reading at five-minute intervals from the beginning of the reading. The mean of all readings was 110 mm. In 64 out of the 100 cases the first reading gave the highest figure, and the lowest reading was found in a maximum of 21 cases forty minutes after the beginning of the experiment. After the third reading the difference between any two consecutive readings is less than the probable error of difference over the whole series, and is therefore negligible. It is fair to assume that variations in these young men are probably greater than at subsequent ages. The study proves that to get a proper reading investigation must go on for fifteen minutes in a doubtful case if the first reading is at all high. It also proves that small variations in blood-pressure with reference to the basic pressure of the patient are of no value.

C. C. Cowin² gives a summary of the conditions in the ocular fundi in arterial hypertension. He considers that *retinal arteriosclerosis* is part of the clinical picture of (1) renal disease, (2) heart disease, and (3) hypertension, whether benign or malignant. There is evidence to show that the progressive types of hypertension originate in diffuse lesions of the vascular system of which the renal involvement is a part but not the cause. The accessibility of the retinal arteries affords valuable information in the study of these changes for differential diagnosis, for the progress of the disease, and for prognosis.

Cowin distinguishes two main types. In the first, retinal arteriosclerosis, there is restriction of the calibre of the arterioles, i.e., retinal arteries, with exaggeration of the arterial stripe and variation of the lumen. As a subsidiary type he describes that seen in old age, which is a reduction in the calibre, with actual restriction and with diminution of the arterial reflex stripe, and slight if any irregularity in the lumen. The retinitis associated with hypertension is characterized by scattered cotton-wool patches, hæmorrhages, and sometimes by generalized œdema of the retina. In the more

malignant cases there is œdema of the disc, varying from hyperæmia and marginal blurring to the elevation of several diopters. In these types are seen the punctate exudates of residual œdema commonly known as the 'macular star'.

The retinal appearances in cardiac disease are also reviewed. The petechial hæmorrhages in subacute bacterial endocarditis are like those in the conjunctivæ, rounded, and have a small yellowish-white centre. Other appearances are sometimes noted—flame-shaped, perivascular, and subhyaloid. Ninety per cent of patients with heart disease and hypertension show some degree of retinal arteriosclerosis, and in any case, therefore, in which there is retinal arteriosclerosis heart disease should be suspected. Absence of retinal arteriosclerosis would normally exclude this possibility.

The author refers to the fact that active constriction of the arterioles can be demonstrated to precede cases of toxæmia of pregnancy, and the appearances may be used as a means of ascertaining the effect of treatment in controlling the toxæmia.

TREATMENT.—A. H. Douthwaite³ gives a useful summary of the treatment of hyperpiesia. He urges no greater restriction of exercise than is dictated by the patient's symptoms and signs. Though restriction to bed may lower the blood-pressure by 20 mm. of mercury, moderate exercise, by flushing the tissues, may do the same. Incidentally it has been determined by W. Bröcker and W. Kempmann⁴ that patients with hyperpiesia have an almost constant increase in their basal metabolism up to 50 per cent, and commonly between 20 and 30 per cent, which may explain the flushing of the tissues of these patients which occurs on the slightest exertion. The main rule of treatment is the avoidance of hurry, especially after meals.

As regards **Diet**, Douthwaite is against the exclusion of all meat, though he thinks that eggs, brain, liver, and fat should be restricted in the attempt to lower the cholesterol in the circulation. The national experiment during the War showed clearly that meat in moderation does not alter the arterial tension. He advises moderation in the use of purgatives, and looks upon daily saline cathartics as obnoxious and useless. As regards drugs, nitrites are valueless except for the emergency of anginal symptoms. Iodides are also useless except when the hyperpiesis is associated with syphilis. **Bromides** are useful in allaying restlessness, and **Thyroid** is valuable in the obese menopausal patient. When the pressure has to be reduced at all costs he finds intramuscular injections of **Acetylcholine** very effective for a period of several hours; the dose is 0.05 to 0.1 grm. daily. This drug is useless taken by the mouth, and dangerous if given by the intravenous route. The great value of **Venesection** as a rapid method of relieving symptoms is referred to.

T. L. Althausen and W. J. Kerr⁵ give some experiments on the action of **Watermelon Seed** in hyperpiesis. This action depends upon a glucoside-saponin named 'cucurbocitrin', which has the advantage of being active when given by the mouth in capsules containing 50 mgrm. The action persists for twenty-four hours and may be used to produce persistent diminution of pressure: 82 per cent of all cases showed a relief of symptoms referable to the hyperpiesis, and the individual symptoms, though variable in the degree to which they were relieved, were diminished. Its value lies in the relief of symptoms, in the diminution of the extra load on the heart, and possibly in the prevention of vascular changes. The simplicity of its administration and the absence of undesirable effects are great advantages.

[REFERENCES.—¹*Arch. of Internal Med.* 1929, Aug., 229; ²*Med. Jour. and Record*, 1930, Feb. 19, 204; ³*Brit. Med. Jour.* 1929, ii, 844; ⁴*Münch. med. Woch.* 1930, Jan. 3, 8; ⁵*Amer. Jour. Med. Sci.* 1929, Oct., 470.

BLOOD-VESSELS, SURGERY OF. (*See BLOOD- AND LYMPH-VESSELS.*)**BONES, LONG, TUMOURS OF.** *E. W. Hey Groves, M.S., F.R.C.S.*

We are still a long way off from knowing the essential nature of new growths, and this applies particularly to those of the bones. It is true that pathologists continue to amass facts and observations about the minute structure of tumours and the minute differences between one tumour and another, but we are as far as ever from understanding the essential nature of malignancy or of the relations between the structure and the clinical course of a tumour. For example, why should a melanoma be of deadly malignancy, whilst a myeloma is practically benign? Or why is it that the most malignant of bone tumours, the small round-celled sarcoma, should be almost indistinguishable in its structure from the healthy healing formation of granulating tissue? In the meantime we are confronted with the practical problem of how to treat patients who have new growths of the bone. Two general principles may help in the solution of this problem: one is the fact that in the malignant tumours amputations do little, if anything, to secure the prolongation of life; the other is that in tumours of uncertain nature and doubtful malignancy **Local Resection** will frequently be justified not only by survival, but by the preservation of a good and useful limb also.

F. Gentil¹ has recorded a remarkable case illustrating the latter point. A girl of 14 had a central sarcoma affecting the middle of the shaft of the right tibia. This proved eventually to be a spindle-celled sarcoma with a fair number of giant cells. The greater part of the shaft of the tibia was resected (20 cm.). A rather greater length of the fibula was cut from its two ends and swung across to fill the gap in the tibia, still retaining its soft-part connections. The two ends of the fibula were implanted in the tibia. This was followed by a most successful result. The newly constituted tibia rapidly assumed an almost normal thickness and length, and—most interesting of all—twenty years after the operation the woman was alive and well and walking without pain or difficulty.

H. Rogers² reports another case of a tumour growing in the shaft of the femur in which it is probable that, had its true nature been recognized earlier, the limb might have been saved. The patient was a working man of 34, who in 1927 fractured the shaft of the right femur by a quite trivial accident. A few months later, after apparent recovery, he again injured the leg. A fusiform swelling was found to occupy the middle of the thigh. The X-ray showed a honeycombed appearance in a large mass of callus (*Plate IV, A*). Exploratory operation was done, a quantity of soft growth scraped out of a central cavity, and 150 mgrm. of radium was left in place for twenty-four hours. This treatment was repeated five months later, but shortly afterwards the continuity of the bone gave way, and the resulting fracture gave so much pain that the limb was amputated at the upper end of the thigh (*Plate IV, B*). The microscopical reports are most interesting. The findings at the first operation revealed a mass of polyhedral plasma cells which might easily have been mistaken for those of a round-celled sarcoma (*Plate V*). There were no giant cells. Thus the tumour is said to be a plasma-celled myeloma or plasmacytoma. The material removed at the second operation consisted chiefly of fibrous tissue with a very few plasma cells, whilst tissue taken from the amputated limb showed no evidence of new growth at all. This proves that the scraping and the application of radium on two occasions had destroyed the tumour; and that the man is alive and well two years after amputation confirms the fact that the tumour was essentially benign. In the light of

PLATE IV

PLASMA-CELLED MYELOMA OF FEMUR

(H. ROGERS)

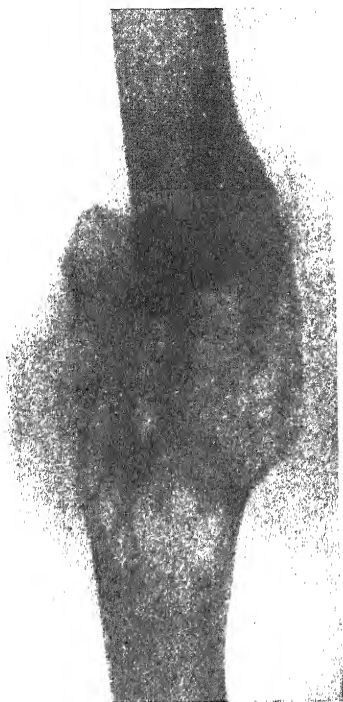


Fig. A.—Skiagram showing honeycombing of callus uniting the fracture.

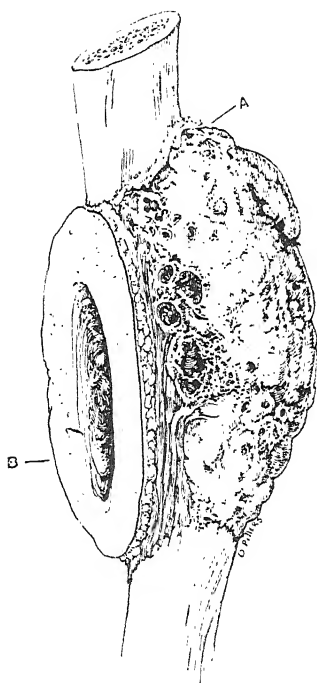


Fig. B.—The femur after amputation. A, Site of fracture from extension of growth up the bone; B, Skin.

*Plates IV and V by kind permission of the
'British Journal of Surgery'.*

PLATE V

PLASMA-CELLED MYELOMA OF FEMUR—*continued*

(H. ROGERS)

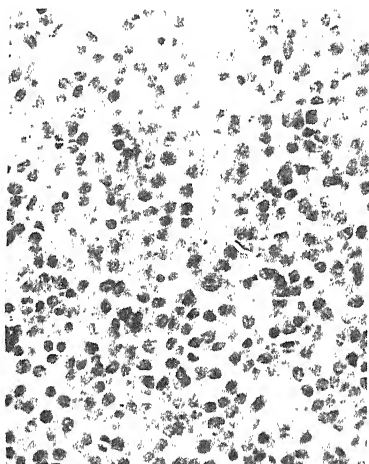


Fig. C.—High-power photomicrograph of tumour, showing typical cell appearance and scanty stroma.

this knowledge, if such a case now presented itself, it would be better to do a local resection of the shaft of the femur and to replace the resected part by means of a segment of the fibula.

REFERENCES.—¹*Lyon chir.* 1929, Aug., 465; ²*Brit. Jour. Surg.* 1930, Jan., 518.

BOOKS, INFECTION FROM. (See INFECTION FROM BOOKS.)

BOTULISM. (See FOOD AND THE PUBLIC HEALTH.)

BRADYCARDIA. (See HEART, ESTIMATION OF EFFICIENCY OF.)

BRAIN ABSCESS. (See EAR, DISEASES OF.)

BRAIN, TUMOURS OF. (See also INTRACRANIAL HÆMORRHAGE; PITUITARY TUMOURS; TUBERCULOSIS OF THE CENTRAL NERVOUS SYSTEM.)

Geoffrey Jefferson, M.S., F.R.C.S.

Decompression for Cerebral Tumours.—The operation of decompression for cerebral tumours is the oldest and best established in neurological surgery. The technique of the operation has been steadily improved and standardized so that the old cerebrospinal fistulæ, suppurating brain fungus from burst wounds, and huge insufficiently protected herniations are not often seen. When they do occur they result from definite errors in procedure, or from some exceptional urgency in the completion of the operation which necessitated the sacrifice of essential steps. Decompression is not now so commonly done as the main operation or as an end in itself as was the case some years ago. We have learned that in order to obtain the greatest benefit from the operation it is necessary that it should be performed in the same dural compartment as that occupied by the tumour—right or left, supra- or infra-tentorial. There are disadvantages in a left-sided decompression, as aphasia may result, and with a left-sided tumour it is perhaps best to perform a small bilateral decompression rather than make a large opening over important speech centres. N. Guleke¹ has been impressed by the danger of performing a suboccipital cerebellar decompression if the tumour lies above the tentorium, and this is perfectly correct. The German authorities appear to find the operation dangerous in any case, even when a cerebellar tumour is present, and the figures which were produced from Vienna by Schoenbauer were certainly unusually bad. Thus, of 13 cases—7 cerebellar gliomata and 6 acoustic neuromata—5 patients died immediately after operation. In 8 cases where the cerebellum was decompressed under a mistaken diagnosis, 6 died immediately. It must be admitted that the acoustic neuromata which Guleke figures in his paper are of enormous size. Earlier diagnosis rather than better operative technique seems to be the clue to better results. British and American figures are much better than the German, but the fact remains that patients are occasionally lost quite suddenly after cerebellar operations, when there was every reason to expect their recovery. In good and expert hands this is not due to any fault in the operation, but to the hazards of where the tumour lies and what it involves, the release of pressure causing 'tumour shift' and faulty vascular irrigation of vital centres. Cerebellar tumours are often cystic, and these cases give good results. The performance of a subtemporal decompression for a cerebellar tumour is not fraught with so much danger as the reverse process, but the hydrocephalic ventricle is very apt to cause a large hernia to develop unless a cerebellar decompression is done later to correct the retention of cerebrospinal fluid in the ventricles.

'Tumour shift' deserves a few more words of explanation. It is an unpleasant fact that after a decompression or a negative exploration through a

flap on a tumour subject, new symptoms sometimes appear, or existing symptoms are made worse. The ideal which controls all the operations done by neurological surgeons is that the patient shall not be made worse by the procedure, and in the vast majority of cases this ideal is at least attained and usually surpassed. But at times things do not go right after an operation such as a plain decompression where the manipulations performed by the surgeon cannot in themselves be blamed for the result. At the most the sequel may have been the death of the patient, as mentioned above, or some lesser disaster such as an increased paralysis or difficulty in speech. Some years ago W. Trotter² drew attention to these happenings in a few sentences, and attributed them quite properly to the tendency of the tumour to 'drift' towards the decompression opening. Thus the best results will be obtained if the pressure relief is given precisely over the tumour, and it is with this in mind that we have said that the decompression should, if possible, be made in the same dural compartment as the tumour. There are times when it may be wise to make the opening on the right side even when the tumour is known to be on the left, but great caution is needed in selection of cases. In a most interesting paper, H. Cairns³ points out that use can be made of the very facts which harass the patient and surgeon alike. In two cases observed by him in Cushing's clinic the new symptoms which appeared made it possible to localize a tumour whose precise whereabouts had not previously been determined. In one case after a negative occipital exploration an increase of anaesthesia in the contralateral hand made it certain that the tumour lay farther forward in the parietal region than had been thought. A second operation led to the discovery of the tumour, actually temporal in site. In another case after ventriculography a positive Babinski reflex appeared in the right foot, disclosing the side which should be explored. The tumour had been thought, on clinical grounds, to be on the right side till this new sign corrected the localization. The untutored are likely to blame the surgeon for some clumsiness or technical error in his operation when symptoms appear in the manner denoted. It is important that as many as possible should be made aware of 'tumour drift' so that as much as possible may be learned from it. As we have seen, the facts may be turned on occasion to the advantage of the patient.

Having regard to the general mortality-rate of intracranial operations, important figures have been worked out on Cushing's material.⁴ The most fatal tumours are the tuberculomata (*see* TUBERCULOSIS OF CENTRAL NERVOUS SYSTEM) with a death-rate of roughly 29 per cent. Next come the metastatic tumours with 21 per cent, then the gliomata with 19.4 per cent, the acoustic neuromata with 12.7 per cent, the meningiomata with 11.4, and best of all the pituitary adenomata with 6.2 per cent. These figures give surgeons some idea of what may be expected by good work, and give practitioners an inkling of the risks their patients will run. But it must be admitted that in the hands of the general surgeon who has not learned to pay attention to special details, and particularly unless he plans his attack well, results as good as these will not often be obtained. Even the specialist is likely to achieve better and better results as the years pass and his experience grows. But this is true of all forms of major surgery, and similar considerations will be found to vitiate the statistical expectation of life in patients undergoing all serious operations. In general, it may be said that a well-planned decompression is a good operation in the majority of cases with a low mortality-rate, but it will not always help the very highly compressed patient, who may easily die in spite of it. Early diagnosis, or, what is just as good, early suspicion that a patient may harbour an intracranial tumour, is the vital point, so that the

sufferer may have such chance as surgery can offer him without the hazards that very high intracranial pressure brings.

Ventriculography.—The value of ventriculography as a help in the diagnosis of intracranial tumours is now surely established. The number of cases in which it is used depends largely on the skill of those in charge of the neurological service, not only in eliciting positive signs, but in correctly interpreting their meaning. The radiograms obtained after filling the ventricles with air rarely show the outline of the tumour, but we obtain evidences of such distortion of shape as the tumour may have inflicted on the ventricular pattern. The technique of this purely diagnostic operation of ventriculography is more or less standardized. W. J. Gardner⁵ and C. H. Frazier⁶ bring forward a slight modification which has its advantages, and had, indeed, already been used by the present writer before reading this paper. Instead of being injected by the positive pressure of a syringe, the air is allowed to enter by natural aspiration. This is effected by tapping the posterior horns of both ventricles and inserting a cannula into each. The pressure is now estimated with a manometer, and the fluid allowed to drain away until no more comes. By rotating the head first to one side and then to the other, a further flow may come from the lower cannula whilst air enters through the other. The ventricles are thus drained of cerebrospinal fluid and filled with air by a process of siphonage. The advantage is that the intraventricular pressure is the same as that of the atmosphere, though, to be sure, this desideratum can be achieved even if aspiration and injection by syringe is employed. It must be admitted that this method is only of real service in cases of bilateral ventricular obstruction (hydrocephalus)—that is, in cases where the tumour lies below the tentorium—for if the growth is in a hemisphere it is unlikely that free drainage will be obtained from both ventricles, and indeed it may be impossible to find one or even both.

Choked Discs in Intracranial Tumours.—Whilst it is a commonplace that choked discs are the rule in intracranial tumours, it is equally recognized that a tumour may be present without any evidences being registered in the optic nerve-heads. J. S. B. Stopford,⁶ in an important communication, has shown from an analysis of clinical and post-mortem records that the more anteriorly the tumour is placed the less likely is choked disc to be found. He believes that the essential factor is compression of the vein of Galen with consequent hyperæmia of the choroid plexuses and overproduction of cerebrospinal fluid. It is clear that the anterior tumour is so placed that it will not easily cause such hyperæmia. Many previous reviews had already filled in a background in full agreement with Stopford's main contentions. What was new was the explanation he (Stopford) gave. Now W. P. Van Wagenen⁷ has reviewed 145 verified intracranial tumours studied in Cushing's clinic during one year. Of these there were 17 which presented unmistakable signs of tumour but lacked choked disc. In addition, there were 9 cases without significant changes in the optic nerve-heads in a further 81 certain tumour cases which were not histologically verified (26 cases in all with normal discs in 226 tumour-bearers). Types of tumour which cause direct pressure on the optic nerves and prevent them from venous congestion, giving rise, in fact, to pressure atrophy (these comprise especially the pituitary tumours and suprasellar meningiomata), have been very properly excluded from Van Wagenen's survey. Of the 17 verified cases of tumour without choke, 6 were in the posterior fossa (3 acoustic neuromata, 1 mid-line cerebellar tumour, 1 anomalous tumour in a cerebellar tonsil, 1 glioma in the medulla oblongata). These cases are interesting because it is generally admitted that subtentorial tumours cause early and severe venous stasis in the retina and choked disc; but the

acoustic neuromata are certainly exceptions to this rule in their moderately early stages at least, but it develops sooner or later. Indeed, two of these neuromata in Cushing's clinic developed slight choke during their stay in hospital awaiting operation. It is remarkable that definite evidence of raised intracranial tension may be present even when choke is absent. The explanation of this peculiarity is not easily arrived at, but the fact remains. Of the supratentorial verified tumours, 11 in number, none were frontal, but lay in the temporal or parietal region. Much could be written on the possible meaning of these facts. We shall confine ourselves to one last observation. Of the 26 cases, 30 per cent showed calcification in the tumour (excluding the cerebellars). The very fact of calcification is some evidence of age, and it seems clear that these must have been exceedingly slowly growing tumours. It used to be thought that only the fibrous dural endotheliomata could be expected to show calcification on X-ray films, but it now seems that rather more than one in ten of gliomata exhibit these valuable evidences.

These reviews leave us with the important conclusion that the absence of choked disc is not evidence that the patient has no tumour, and that, contrary to the general belief, it may be absent even when the tumour is subtentorial. If there is clear evidence of a progressive local lesion, the probabilities are that the cause will eventually be proved to be tumour even though the optic discs are flat. We must not be too much impressed by the absence of choked disc, and weaken on the diagnosis of tumour because of this omission. The pathology of 'choke' is even yet not settled, and any explanation must take into account these negative findings as well as the positive ones. It might be thought that the cases which do not show papilloedema are those in which a malignant tumour had replaced brain tissue without increasing the intracranial bulk, so that the mean intracranial tension remained unaltered. It is clear from Van Wagenen's survey that the tension may be raised and that the explanation just given is not watertight. I have no doubt about the truth of Van Wagenen's statement, for I have certainly seen raised intracranial tension in several cases which failed to exhibit choked disc.

Enlargement of Blind Spots in Cerebral Tumour.—It will be recollected that the optic disc is itself insensitive to light and gives rise to a blind spot easily charted on the perimeter. When the optic nerve-head becomes oedematous and choked it increases somewhat in size, pushing the sensitive retinal cells a little out in all directions. The effect of this is to cause enlargement of the blind spots. Loyal Davis³ has made a practice of charting the sizes and shapes of the blind spots in all cases of intracranial tumour. He has found this to be a most reliable method of estimation of the degree of choke; it is a definitive method giving a metric result. In this it has the advantage over the measurement of the oedema of the disc by the ophthalmoscopic method, where considerable divergence of opinion may exist as to the height of the summit of the swelling. Davis gives charts showing the enlargement of the blind spots and their shrinkage after operation which has caused the oedema and congestion to subside. Its only disadvantage is that it takes some minutes to chart each disc, and it is not a method for the lazy. Its great advantage is that it gives a permanent record and that it encourages perimetric work on brain-tumour patients. Anything which will achieve this is worthy of adoption, for there can be no question of the inestimable value of careful charting of the visual fields in all these cases.

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1929, Nov., 647; ²*Choyce's System of Surgery*, iii, 543; ³*Arch. of Surg.* 1929, xviii, 1936; ⁴*Ibid.* 1929, xviii, 1927; ⁵*Jour. Amer. Med. Assoc.* 1929, July 20, 193; ⁶*Brain* 1928, li, 485; ⁷*Amer. Jour. Med. Sci.* 1928, Sept., 346; ⁸*Jour. Amer. Med. Assoc.* 1929, March, 794.

BREAST, FAT NECROSIS OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

This condition and the difficulties of distinguishing it from malignant disease have been referred to by the reviewer in many previous numbers of the *MEDICAL ANNUAL*. It has been described as traumatic fatty necrosis, indicating its frequent association with injury. It may be found also in the fat of the thigh, in the extra-abdominal fat, in the omentum, and elsewhere (*see MEDICAL ANNUAL*, 1930, p. 84). Clinically it resembles carcinoma of the breast more than any other tumour, but a distinct history of trauma and a well-circumscribed mass showing rapid increase in size, unassociated with pain and without axillary nodes that are firm, suggest the possibility of fat necrosis.

G. Hadfield¹ in his paper says it would be misleading if some attempt were not made to place the subject of extra-pancreatic fat necrosis in its proper perspective from a purely pathological point of view.

H. A. Cookson² describes a case. He emphasizes the superficial situation, the smallness of the lesion, and the absence of enlarged glands. He suggests the term 'mammary panniculitis' as a substitute for fat necrosis.

REFERENCES.—¹*Brit. Jour. Surg.* 1930, April, 673; ²*Brit. Med. Jour.* 1930, ii, 1043.

BREAST, TUMOURS OF. (*See also NIPPLE, PAGET'S DISEASE OF.*)

Sir W. I. de C. Wheeler, F.R.C.S.I.

There is a plethora of literature on this topic, and the number of monographs each year has become quite unwieldy.

The Changing Clinical Picture of Breast Lesions.—J. C. Bloodgood¹ discusses this subject at great length. He divides breast tumours clinically into two great groups: (1) Those in which the patient is twenty-five years of age or under; and (2) Those in which the patient is twenty-five years of age or over. In the former the idea of malignant disease may be discarded; in the latter it must be seriously considered. At the end of his paper he says:—

"Shall we postpone operation if there is a single definite tumour in one breast which palpates like a spherical cyst and fluctuates, and transilluminates clear, and when this and the other breast are otherwise normal? I am beginning to do this in a few instances. Unless you have had considerable experience this postponing the operation may be dangerous. However, if, in addition, there is a definite history of change in size or even disappearance, and both breasts are lumpy, delay is less dangerous. If there are definite multiple tumours, there is no danger in delay.

"In all other types of a definite single tumour in women over twenty-five years of age, any delay is unjustifiable, and there is no way, clinically, of distinguishing the benign from the malignant. It is also safer that such a patient should be operated on in a hospital where the surgeon is prepared to make and interpret frozen sections during the operation."

In a patient operated upon recently in Mercer's Hospital, Dublin, the diagnosis of chronic cystic mastitis was made. Both breasts were similarly affected and none of the classical signs of malignancy was present. In the left 'lumpy' breast one cyst was as large as a walnut; it felt hard, but transilluminated well. The breast was dissected from below up as a flap from the chest wall, and the cyst with the rest of the gland was removed. The nipple and the remainder of the breast were left intact. The report of the pathologist was 'chronic mastitis', but at one microscopic point malignant change had occurred. This microscopic portion was in the centre of the tissues removed. No further operation was performed. Post-operative X-ray therapy was recommended. It is an example of the great difficulty of diagnosing very early malignant change in the breast.

Bloodgood² states that multiple cysts with papillomas are not necessarily malignant. Fully developed cancer in its earliest stages cannot be distinguished in the gross from a non-encapsulated adenoma or area of mastitis. We must no longer depend upon the gross appearance; we must depend upon frozen sections. It is better to perform the complete operation in non-malignant cases where there is doubt at the time of operation than to make the reverse mistake. Bloodgood suggests that the entire tumour with its zone of breast tissue should be excised in doubtful cases, the wound packed with an alcohol sponge, and the tumour opened. It may be a typical blue-domed cyst, an abscess, or a distinctly encapsulated tumour. If otherwise, and the pathology is not absolutely clear, the operation should be complete as if in cancer.

Hæmorrhage from the Nipple.—Practitioners need more guidance as to the significance of discharge from the nipple in cases of tumours of the female breast. G. V. S. Smith and G. A. Marks³ state that discharge from the nipple in a series of 201 cases was complained of by 14·2 per cent of patients with papillary cystadenoma, and 8·8 of those with chronic mastitis. F. E. Adair⁴ states that there are few clinical problems which present such wide divergence of opinion as does the subject of the bleeding nipple. To many surgeons a bleeding nipple immediately conveys the idea of cancer, while to others the condition suggests a benign tumour. He says that microscopical examinations of stained smears of nipple discharges and transillumination are great aids to diagnosis. He refers to a paper by M. Cutler⁵ on transillumination of breast tumours, and quotes him as saying: "Many investigators favour the view that a hæmorrhagic discharge from the nipple of a non-lactating breast is evidence of a benign rather than of a malignant lesion and is almost a sign of intracanalicular papilloma (Bloodgood, Greenough and Simmons, Deaver and McFarland, Sistrunk). Miller and Lewis, on the other hand, found the same proportion of benign and malignant tumours associated with this symptom, and Judd, in a review of 100 cases, reached a similar conclusion."

A thin serous or blood-stained discharge is often regarded as indicative of an intracanalicular papilloma, a frank bloody discharge indicates carcinoma, and a discharge which may look blood-stained but which contains no blood is indicative of chronic mastitis. Smears from the discharge which contain pus cells, desquamated lining cells, cell detritus, and crystals are typical of chronic mastitis but are not found in cancer. Adair states that the transillumination test is of great value in localizing lesions responsible for the bleeding. Light rays will not readily penetrate hard carcinomatous tissue, and the lesion containing blood or surrounded by blood appears black on transillumination. Adair's paper is summarized as follows:—

1. There is wide divergence of opinion as to the significance of a serous, serosanguineous, or bloody discharge from the nipple.

2. This study, based on 108 cases of bleeding nipple, demonstrates cancer in 47·2 per cent, and a benign condition in 52·8 per cent. The syndrome of a bloody discharge from the nipple is therefore of great clinical importance.

3. Microscopic study of the smear from the discharge is of decided value, particularly in excluding many cases which *appear* to have bloody discharge, but which on a microscopic study prove not to be bloody. Two hundred such cases were excluded from this report.

4. Transillumination of the breast is of great help in making a differential diagnosis and in *locating* the offending lesion. Bleeding tumours are opaque to transillumination.

5. The average age of patients with papillary cystadenoma and papilloma of the duct is 42 years; of papillary adenocarcinoma is 54½ years.

6. There are more papillary adenomas in cysts than any other single lesion producing bleeding at the nipple.

7. Dark stagnant bloody discharge signifies duct carcinoma in most instances.

8. It is believed that the benign papillary cystadenomas eventually develop into the papillary cystadenocarcinomas.

9. *External irradiation* by two high-voltage X-ray treatments or by one radium pack of 10,000 millicurie-hours stopped the bleeding in 50 per cent of the cases. However, bleeding ceased temporarily. It is admitted that radiation was not adequately pursued to draw ultimate conclusions concerning cure.

10. In six instances the papilloma descended the nipple duct, appeared at the nipple surface, and produced continuous external bleeding. In one case the secondary anemia was profound, the hæmoglobin being 40 per cent.

11. Bacteriological studies of the discharge were negative, ruling out a bacterial origin.

12. Of the eighty-nine cases operated on, bleeding ceased in 95 per cent.

13. Fifty-two per cent of bleeding nipple cases are cured by the simplest type of surgery. This extirpation is considered as important preventive cancer surgery.

Lymph-glands.—J. M. Wainwright⁶ says that the first area for involved lymph-glands in breast cancer is on the anterior surface of the pectoralis major muscles, and not behind the muscle in the axillary space. These glands are not mentioned by other authorities. He maintains that in every operation for breast cancer the anterior surface and edge of the pectoralis muscle should be considered as important as the axilla, and that this area should never be exposed or handled, or traversed by fingers, instruments, or gauze.

Radiotherapy in Cancer of the Breast.—

X Rays.—The part played by Roentgen therapy in carcinoma of the breast is still a matter of discussion. G. E. Pfahler and L. D. Parry⁷ make a good case in the routine employment of X rays. Pre-operative treatment and post-operative treatment are advised because the devitalization of cancer cells is a recognized effect of irradiation both clinically and experimentally. Taking the good and bad results, post-operative Roentgen treatment gives 75 per cent improvement over surgery alone. A combination of surgery and irradiation gives the best results. The authors' paper is summarized as follows:—

1. This study is based on a review of 939 private patients who were referred for treatment on account of cancer of the breast and who were treated three or more years ago.

2. In 90 per cent of the cases a lump, pain, or an injury was the first sign to attract the attention of the patient.

3. The average duration of symptoms before the patients applied for any kind of treatment was nineteen months, and the average time after operation and before being referred for Roentgen treatment in the post-operative and recurrent group (646 cases) was fifteen months, showing the general unfavourable group on which these statistics are based.

4. Pre-operative treatment and post-operative treatment are advised, because of theoretical, experimental, and clinical proof of their value. In the advanced cases of carcinoma, with involvement of glands, pre-operative and post-operative treatment give 46 per cent of five-year cures, while 38 per cent of the totally inoperable cases are made operable, and in 10 per cent of these the patients were alive after five years.

5. Post-operative treatment was used in 242 cases (only 25 per cent of 939 cases). Of the patients without involvement of glands 89 per cent, and of those with involvement of glands 47 per cent, were symptom-free after five

years. Post-operative treatment is therefore advised in all cases within two weeks after operation. The statistics recorded in the literature show 20 per cent of five-year cures by operation alone when glands are involved, and 35 per cent when irradiation is added. Taking the good and bad reports, it is evident that post-operative Roentgen treatment gives 75 per cent improvement over surgery alone, and the authors' own records show approximately 100 per cent improvement. Primary operable carcinoma should be treated by irradiation when operation is contra-indicated, but in general it would seem that a combination of surgery and irradiation adapted to the individual case may be expected to give the best results.

These conclusions are unfortunately not borne out by the Report of the Committee for the Treatment of Malignant Diseases with Radium and X-ray of the American College of Surgeons,* which is summarized thus :—

1. The study of 536 cases of cancer of the breast from nine different hospitals in 1918, 1919, and 1920, recorded and classified in a uniform manner on a minimum five-year end-result basis and supported by pathological evidence of the diagnosis of cancer, yields the following results :—

2. Twenty per cent of all cases entering the hospital are alive and well at the end of five years after treatment.

3. Twenty-five per cent of all primary cases are alive and well at the end of five years.

4. Twenty-eight per cent of the 'operable' cases are alive and well at the end of five years.

5. The early favourable cases without axillary involvement give 57 per cent of successful results.

6. The more advanced cases with axillary glands involved give only 16 per cent of successful results.

7. The 'inoperable' cases, with remote metastases, are all dead.

8. Of the cases entering the hospital with recurrence after operation only 3 per cent are alive and well.

9. No successful results were obtained without operative treatment.

10. In primary cases the best results (29 per cent) were obtained by the standard radical operation, with or without prophylactic X rays. Exact data as to dosage of X rays employed in these cases were not always available. In general low-voltage treatment was in use at this time.

11. In primary cases incomplete operation with or without X rays gave only 10 per cent success.

12. In primary cases X rays alone gave no success.

13. The results of the standard radical operation with removal of both pectoral muscles (34 per cent) were superior to those in which the pectoralis minor was not removed (26 per cent).

14. The addition of pre-operative or post-operative prophylactic X-ray treatment to the radical operation gave no greater proportion of five-year successful results.

15. Prophylactic X-ray treatment did not prolong life in the unsuccessful cases.

16. Prophylactic X-ray treatment did not diminish the incidence of local recurrence in the field of operation in unsuccessful cases.

17. There is no evidence in this series of cases to support the contention that prophylactic X-ray treatment is of value as a supplement to operation in cases of cancer of the breast.

18. The value of X rays in the treatment of recurrence after operation is established.

19. Three patients are alive and well over five years as a result of X-ray

treatment of recurrence. In one of these excision of the recurrence was performed in addition to X-ray treatment, but in no case was the recurrence proved by pathological examination.

20. Patients with recurrence treated by X rays lived longer than those in which X-ray treatment was *not* given.

21. The most marked benefit from X-ray treatment was obtained in the cases of local recurrence in the field of operation or in the axillary region.

22. Advanced cases with remote metastases were little benefited by X-ray treatment.

Radium.—The radium treatment of carcinoma of the breast has been followed in recent years by some remarkable results. Surgeons are becoming educated to the fact that early cases of cancer of the breast can be as successfully treated by radium as by operation. G. Keynes⁹ gives an excellent résumé on the subject. Platinum needles containing radium should be buried so that both the primary growth and every accessible area of lymphatic drainage are subjected to adequate irradiation. The full details of technique were published previously.¹⁰ Keynes concludes as follows:—

1. It is clear that, for inoperable tumours, radiology is the only treatment possible; too much must not be expected of radium, though the treatment has to be given, since a remarkably good result can be obtained in certain of these patients whom surgery could not have helped.

2. In those patients in whom the disease is advanced though still operable, final results are likely to be disappointing whatever treatment is used, because the majority will die eventually of dissemination; but patients treated by radium at least are unmutilated, and do not suffer from the œdema of the arm which is frequently a distressing feature of patients treated by operation.

3. In the early cases radium is the treatment of choice. The tumour disappears within a few weeks, the tissues usually become normal, and, so far, in no early case has recurrence taken place. The patient is unmutilated, and may even be able to use the breast for normal lactation. It is likely to be many years before the surgical world at large is ready to subscribe to this opinion.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, Jan., 27; ²*Ann. of Surg.* 1929, Nov., 886; ³*Surg. Gynecol. and Obst.* 1929, Sept., 316; ⁴*Ann. of Surg.* 1930, Feb., 197; ⁵*Surg. Gynecol. and Obst.* 1929, June, 721; ⁶*Amer. Jour. Surg.* 1929, Nov., 671; ⁷*Jour. Amer. Med. Assoc.* 1930, Jan. 11, 101; ⁸*Surg. Gynecol. and Obst.* 1929, Aug., 253; ⁹*Lancet*, 1930, i, 439; ¹⁰*St. Bart's Hosp. Rep.* 1927, ix, 203.

BRIGHT'S DISEASE. (See RENAL DISEASE.)

BRONCHI, FOREIGN BODIES IN. (See FOREIGN BODIES IN ŒSOPHAGUS AND BRONCHI.)

BRONCHIAL FISTULA. (See LUNG, ABSCESS OF.)

BRONCHIECTASIS. (See also LUNG, ABSCESS OF; NASAL SINUSES, DISEASES OF.) *W. H. Wynn, M.D., F.R.C.P.*

A. Ochsner¹ considers that bronchiectasis is the most frequently encountered chronic pulmonary affection, occurring even more frequently than tuberculosis. Many cases of bronchiectasis are diagnosed and treated as pulmonary tuberculosis. In his experience bronchitis is by far the most frequent cause. In a series of young students suffering from chronic bronchitis or attacks of acute bronchitis, giving no clinical evidence of bronchiectasis, a definite bronchial dilatation was found in over 90 per cent. The clinical picture described in text-books represents a late stage. While there are many instances of such

advanced disease, they are much less frequently met with than the early cases. The early symptoms and signs are relatively insignificant. Patients may have no sputum, others sputum only during acute exacerbations. The sputum is rarely foetid, although at times it may have an unpleasant taste. Except in cases of 'dry bronchiectasis' the effect of posture is almost invariably noted. The cough is exaggerated when the patient assumes certain positions, especially at night. Hæmoptysis is frequent, being present in 50 to 70 per cent, but it is seldom severe. The patient feels well except perhaps for slight lassitude. Because of vague indefinite symptoms they may be labelled as neurasthenic. The physical signs vary and are slight. Almost invariably there is slight lagging of the affected side, especially at the base. There is no change in the percussion note in early cases, and auscultation reveals little, although moist râles are usually audible at the base. These may be localized to a small area. Bronchography with lipiodol is of special value in these early mild cases. The advanced case can be diagnosed without bronchography, but at the present time it is generally accepted that a diagnosis of bronchiectasis should not be made without positive X-ray examination after introduction of a contrast substance. The author lays stress upon the importance of the radioscopic observation of the mode of filling of the bronchi because of the possibility that the lipiodol may pass into the alveoli and obscure the bronchi. The dilatation may be very evident immediately after the introduction of lipiodol, but impossible to detect a few minutes later. He considers that bronchiectasis limited to a single lobe is ideally treated by extirpation of the involved lobe, but because of the frequent bilateral involvement and the high mortality from operation relatively few cases can be treated. The **Cautery Pneumectomy** is the method of choice. The medical or conservative treatment has been unsatisfactory, but **Postural Drainage** is of distinct benefit. Ochsner finds that the introduction of **Iodized Oil** is of distinct therapeutic value. In 1500 bronchographies with lipiodol there were never any untoward reactions. In 6 cases there was evidence of iodism, varying from a slight rhinitis to a rather severe erythema. All the reactions disappeared in twenty-four hours. Other authors have had a similar experience of the innocuousness of the method. Repeated introductions of iodized oil into the bronchi was the treatment in 112 cases. The largest number of fillings to one patient was sixteen. A definite improvement was noted in all. In 35 cases (32 per cent) there was complete relief of all symptoms, yielding a symptomatic cure, though there was still radiographic evidence of dilatation. In 4 cases not only was symptomatic relief obtained, but the dilatation of the bronchi disappeared. In 41 (36 per cent) symptomatic relief was obtained, but cough and sputum returned slightly after an acute respiratory infection. In the remaining 36 improvement was marked, but the patients are still under treatment. The author does not feel that iodized oil is a panacea for all cases of bronchiectasis, but those cases with little anatomical change or a bilateral process, as well as those in whom operation is contra-indicated, may be greatly benefited and possibly even cured.

Ochsner² in another paper describes his 'passive method' of introducing iodized oil. Following the use of an antiseptic mouth-wash the anterior surface of the anterior tonsillar pillars is painted with 10 per cent cocaine. The anaesthesia is continued until the swallowing reflex is abolished, as evidenced by the immobility of the larynx on attempted swallowing. As soon as anaesthesia is complete the patient is instructed to take about 3 c.c. of a 3 per cent solution of procaine hydrochloride into his mouth. He then tips his head backwards, protrudes the tongue so that the procaine solution enters the pharynx, leans slightly to the side which it is desired to fill, and breathes. The

PLATE VI

ATELECTATIC BRONCHIECTASIS

(A. J. S. PINCHIN AND H. V. MORROW.)

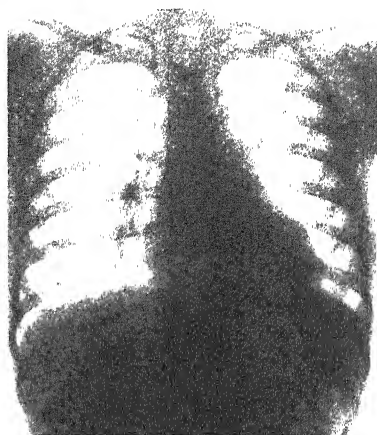


Fig. A.—Showing triangular shadow within the cardiac shadow.

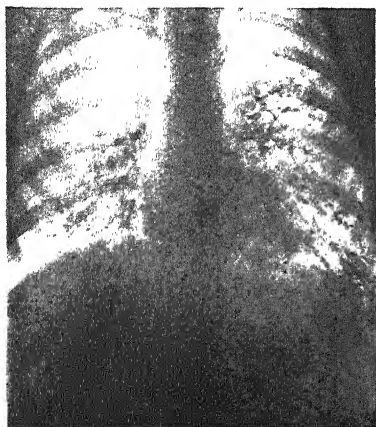


Fig. B.—Triangular shadow absent. Lipiodol showing no evidence of bronchiectasis.



Fig. C.—Showing the triangular shadow with bronchiectasis within it.

*Plates VI and VII by kind permission
of the 'British Medical Journal'*

PLATE VII

ATELECTATIC BRONCHIECTASIS—*continued*

(A. J. S. PINCHIN AND H. V. MORLOCK)



Fig. D.—Showing bronchiectasis within the triangular shadow.



Fig. E.—Showing triangular shadow at right base.

procaine is used as an anæsthetic to the tracheobronchial mucosa. The anterior pillars are again painted with cocaine, and the patient is placed behind the X-ray screen and given 10 c.c. of iodized oil and instructed to assume the same position as he assumed when inspiring the procaine solution. The entrance into the trachea and bronchi is observed on the screen. The patient spits out the saliva which has accumulated and then aspirates another 10 c.c. of the iodized oil.

A. J. S. Pinchin and H. V. Morlock³ discuss the triangular shadow not infrequently seen at the base of the lung on X-ray examination (*Plates VI, VII*). The shadow is a rectangular triangle, one side of which rests on the diaphragm, the other along the mediastinum, the hypotenuse running from the mediastinum to the diaphragm. This shadow may appear on either side of the mediastinum, and when on the left is obscured by the cardiac shadow. A series of patients showing this shadow were injected with lipiodol, and bronchiectasis was demonstrated within the shadow. The cause seems to be an atelectasis occurring after pneumonia in a position where the lung is shielded from the more forcible respiratory movements, lying as it does in the recess formed by the spine, ribs, and angle of the diaphragm.

G. E. Martin⁴ has treated 61 cases bronchoscopically, using an **Aspirating Bronchoscope** with a continuous suction and carrying out as complete an aspiration as possible. A two-way cannula, one tube being for continuous suction, is passed through into the cavity, which is aspirated and dried as far as possible. Through the second tube weak boric solution is pumped into the cavity, which is washed and cleaned. It is then mopped out and dried, and in many cases painted with spirit, partly to cause local reaction and adhesions. The age of the patients varied from $5\frac{1}{2}$ to 57. In 16 cases the condition was bilateral, in 25 on the left, and in 12 on the right. In 7 cases no cavitation was found bronchoscopically, and these cases all cleared up with one or two bronchoscopies. Of the 61 cases, 2 completely cleared up after one treatment, and 1 case after two treatments; 2 cleared up after three treatments, 1 after five, and 1 after ten. There were 15 cures; 2 patients, apparently cured, died of other complaints, and there were 11 other deaths. Four ceased treatment, and 29 are still under treatment, some coming up once in three or four weeks and some in three or four months. The author thinks that bronchoscopy gives a very efficient form of treatment in early cases, and one lavage may be sufficient. There is so little upset to the patient that lavage can be given once a week, though it is better to wait three weeks. Chronic cases are not so satisfactory; the patient's outlook on life is much altered, and he is often able to return to work, but he has to empty his chest periodically and is open to the risk of acute exacerbations.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, March, 388; ²*Jour. Amer. Med. Assoc.* 1929, July 20, 188; ³*Brit. Med. Jour.* 1930, 1, 12; ⁴*Edin. Med. Jour.* 1929, Aug., 153.

BUERGER'S DISEASE. (*See BLOOD- AND LYMPH-VESSELS, SURGERY OF; THROMBO-ANGIITIS OBLITERANS.*)

BURNS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Tannic Acid.—The treatment of burns by spraying with a freshly-made aqueous solution of tannic acid, 2½ per cent, or with dressing moistened in the solution, until the skin is tanned, is now universally adopted. A leathery coagulum is produced which renders the toxins insoluble and acts as an excellent protection to the underlying parts. It should not be forgotten that applications of solutions of tannic acid are equally useful in ulcerating conditions not associated with burns. Recently the reviewer treated a case of

excoriations of the skin from a fecal fistula of the small intestine with applications of tannic acid with gratifying results. (*See also* p. 104.)

In the *MEDICAL ANNUAL* for 1929 (p. 522) attention was drawn to the treatment of varicose ulcers with tannic acid solutions. The ulcer when healing and free of infection is dried with alcohol, and then a 2.5 per cent solution of tannic acid is sprayed on every half-hour until the ulcer is well crusted over. Any clean, granulating wound may be treated in the same way, often with advantage and increased comfort to the patient.

In dealing with burns, shock must be treated with great respect. Some surgeons after administering **Morphia** wait as long as twelve to fourteen hours treating the shock before any local medication is commenced. An anaesthetic should always be administered and is well tolerated.

In a personal communication, Dr. G. Purdy gives a warning against applying tannic acid to the fingers at the tips. The resulting coagulum forms a very tight tourniquet and the finger-tips may slough off. There is some difficulty in treating burns of the buttock which run close to the rectum. The infection tends to spread from the rectum under the tannic acid coagulum. It is best to apply the tannic acid two or three inches away from the anus, and treat the skin in the immediate neighbourhood of the latter with **Flavine** or **Picric Acid** solutions. Tannic acid also fails when the burn is near the mouth.

The preliminary cleaning of the burnt area before the tannic acid is applied should be carried out with **Methylated Ether** and finished with **Methylated Spirits** or **Absolute Alcohol**. The tannic acid coagulum forms better if no watery solutions are used for preliminary cleansing.

F. W. Bancroft¹ draws attention to the high mortality from burns in infants. The first-aid treatment is all-important. Deaths occur in the first instance from shock, and later from toxæmia. In the treatment of superficial burns Bancroft thinks that erythema will be relieved by **Wet Dressings** of any kind. Sodium bicarbonate, tannic acid, or picric acid are all efficacious. Many types of ointment also help to relieve the initial pain. In burns of the second degree blisters may be punctured with a sterile needle, and then a compression bandage should be applied and not disturbed for three or four days. In extensive burns of the third degree the tannic acid treatment will be found to be by far the best. **Morphia** is administered to combat shock, and fluids are given intravenously or into the cellular tissues when necessary. The patient is anaesthetized, and the burnt area with the surrounding skin is cleansed with **Ether and Alcohol**. The epidermis covering all blisters is thoroughly removed. Dressings saturated with a 5 per cent solution of tannic acid are lightly applied, and kept saturated with the solution for twenty-four hours or until the burned area is tanned a mahogany brown. Bancroft prefers this method of applying the solution to that of spraying. No bandages or constricting apparatus are applied. All dressings are removed when the burned area is sufficiently tanned. Sterile pads or sheets are kept beneath the burned areas which rest on the bed. The tanned membrane begins to curl at the edges after a period of one or two weeks. Infection beneath the tanned membrane is indicated by a rise of temperature which persists. In such cases the infection must be treated by excising the membrane as far as possible and applying wet dressings to the granulating area. A solution of **Acriflavine** 1-5000 appears to be the most suitable. It is interesting to note in Bancroft's paper that he recommends 5 per cent solution—double the strength usually employed. He recommends the use of tannic acid for the following reasons: (1) Because it diminishes pain; (2) Because it prevents fluid depletion; (3) Because it decreases toxæmia; and (4) In second and third degree burns it allows

epithelization to proceed while the membrane is in place. He also emphasizes the necessity of using tannic acid in the first-aid treatment, in place of oils or ointments, because it is very much more difficult to treat a burn satisfactorily with tannic acid after a first-aid treatment of caron oil or ointment. Roughly, a 5 per cent solution may be made by adding five teaspoonfuls of tannic acid powder to a glassful of water.

REFERENCE.—¹*New Eng. Jour. Med.* 1930, April 24, 811.

CALCIFICATION OF KIDNEY. (*See* KIDNEY, CALCIFICATION OF.)

CALCIFICATION OF PERICARDIUM. (*See* PERICARDIUM, CALCIFICATION OF.)

CANCER. (*See* INDUSTRIAL DISEASES; RADIUM TREATMENT OF CANCER; *also under various organs, etc.*)

CARDIAC. (*See under* HEART.)

CARDIOSPASM. (*See* OESOPHAGUS, DISEASES OF.)

CATARRHAL COLITIS. (*See* COLITIS, ULCERATIVE.)

CEREBRAL ANEURYSMS. (*See* INTRACRANIAL HÆMORRHAGE.)

CEREBRAL TUMOURS. (*See* BRAIN, TUMOURS OF; PITUITARY TUMOURS; TUBERCULOSIS OF THE CENTRAL NERVOUS SYSTEM.)

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—E. E. Dickson¹ records an outbreak of 30 cases of cerebrospinal fever with 22 deaths at Ojuela, a compactly built and greatly overcrowded mining-town of 5000 inhabitants in Durango, Mexico, between March and July, 1929. The patients' ages ranged between 2 months and 40 years, and the disease was equally prevalent at all ages up to 25. In no instance did two cases occur in the same house or family, although isolation was impossible. The high death-rate was apparently due to the fact that the inhabitants had no fear of the disease, but were much afraid of lumbar puncture, so that they did not report the cases until late or after death had taken place.

Owing to the comparative rarity with which meningococcus carriers contract cerebrospinal fever, considerable interest attaches to the cases reported by H. Kapp² of three soldiers who contracted the disease some time after being in barracks (a few days in two cases and five months in the third) where there had been some cases of cerebrospinal fever. It is probable, however, that such cases as these are really of more frequent occurrence but are seldom recognized.

A. Hoyne and E. T. McEnery,³ who record three cases in which two, three, or four members of a family contracted the disease simultaneously or within a few days of one another, point out that though cerebrospinal fever, like poliomyelitis, is a communicable disease, more than one case in a family is comparatively infrequent. Among 1500 cases reported by Bolduan and Goodwin there were only 88 examples of more than one patient in the family at the same time, and in Neal's series of 500 cases during a period of thirteen years multiple cases in a family were noted only 13 times.

SYMPTOMS AND COMPLICATIONS.—According to R. Pitou,⁴ who records 4 cases, 3 of which occurred in soldiers and 1 in a soldier's son, age 4 years,

meningococcal septicæmia is frequently accompanied by *eruptions*, which he classifies as follows: (1) Erythema, which may be papulo-nodular, morbilliform, scarlatiniform, or assume the appearance of lenticular rose spots; (2) Vesicular eruption, which may be herpetiform, varicelloid, or purpuric, with secondary vesicle formation; (3) Purpura. These meningococcal eruptions, which are due to vascular and perivascular localization of the meningococcus, may accompany or precede cerebrospinal meningitis. Pitou points out that the appearance of an eruption in meningococcal septicæmia is an important sign, as early treatment by intrathecal, and if necessary intravenous, injection of antimeningococcal serum may prevent the occurrence of meningitis.

TREATMENT.—J. B. Neal⁵ states that the following method is adopted by the Meningitis Division of the Research Laboratory of the New York City Department of Health. When the fluid obtained by lumbar puncture is cloudy or hazy, **Antimeningococcic Serum** warmed to body temperature is immediately given by gravity. Further administration will depend on the results of cultivation of the fluid. Intrathecal injections of serum are continued about every twenty-four hours until two successive smears or cultures show no organisms. The usual dose is 20 c.c. if as much or more spinal fluid has been obtained. If much fluid has been withdrawn or escapes under pressure, and the serum runs in easily by gravity, 30 to 40 c.c. or even 50 to 60 c.c. of serum may be given. It is rarely safe to give less than four injections of serum. If signs of blocking occur, ventricular or cisternal puncture should be employed. Intravenous or intramuscular injection is indicated only in meningococcal septicæmia without meningitis. In cases which prove refractory to antimeningococcal serum intravenous injections of **Trypaflavine** have been used with success by J. Priet,⁶ A. Bötzei,⁷ and J. Michelsen,⁸ in doses of 5 c.c. of a 2 per cent solution.

REFERENCES.—¹*Jour. Amer. Med. Assoc.*, 1929, xciii, 1016; ²*Schweiz. med. Woch.*, 1930, 384; ³*Arch. of Pediatrics*, 1929, 699; ⁴*Thèse de Paris*, 1929, No. 243; ⁵*N. Y. State Jour. of Med.*, 1930, xxx, 70; ⁶*Thèse de Paris*, 1929, No. 476; ⁷*Med. Klinik*, 1930, 127; ⁸*Deut. med. Woch.*, 1930, 1044.

CEREBROSPINAL FLUID.

Macdonald Critchley, M.D.

The Circulation of the Cerebrospinal Fluid.—Knowledge of the movements of the cerebrospinal fluid occurring in the healthy subject under normal conditions is very meagre. The problem is a difficult one to investigate, as the introduction of dye substances or the withdrawal of fluid by the lumbar route is apt at once to introduce factors of pathological nature. It is well known that specimens of cerebrospinal fluid obtained from different locations in the same individual—e.g., ventricle, cisterna magna, lumbar theca—differ slightly in composition. Furthermore, it is now almost universally accepted that the fluid arises from both the choroid plexus and the perivascular spaces of the central nervous system, and is absorbed both in the venous sinuses and in the spinal subarachnoid spaces. The question remains, however, as to the existence or not of a 'third circulation'. E. Sachs, H. Wilkins, and C. F. Sams¹ have recently investigated this problem in dogs by the introduction of trypan-blue into the closed subarachnoid space, and the observation of its movements. Special technical precautions were taken to ensure that the total fluid volume, as well as the intradural pressure, was not altered. Their results indicate that there is no true cerebrospinal circulation, but that substances spread in the fluid by a process of diffusion. This is largely influenced by gravity. Oscillations in the fluid due to pulse and respiration do not play any rôle in the movements of the cerebrospinal fluid. Of the greatest clinical importance are their conclusions that the effect of lumbar puncture is to

produce an artificial circulation towards the site of puncture. It is, therefore, vitally important, when doing a lumbar puncture as a diagnostic measure in cases of suspected meningitis, never to withdraw more than the smallest possible quantity. Also, the therapeutic administration of immune serum into the cerebrospinal axis is best done either into the cisterna basalis or directly into the lateral ventricles.

Headache following Lumbar Puncture.—The questions of etiology and treatment of post-puncture headache continue to evade solution. It seems clear that the occurrence of headache does not depend upon the posture of the patient, the amount of fluid withdrawn, or the composition of the fluid. Although F. Depisch and W. Richter-Quittner² found a reduction or even total absence of calcium of the spinal fluid in patients who subsequently developed severe post-puncture headaches, the more accurate and extensive researches of M. Neustaedter, W. W. Hala, and A. Tolstouchow³ show that the content of calcium plays no part in the etiology of these headaches. More recently M. O. Nelson⁴ has made a clinical and experimental research which tends to support the theory of prolonged leakage as a factor in some at least of the cases of post-puncture headache. He examined the histological structure of the spinal dura in a patient who died eleven days after lumbar puncture had been performed. He drew attention to the extreme variability in adjacent portions of the meninges both in thickness and in vascularity. Again, the route traversed by the needle through the dura may be oblique or directly horizontal; the possibility therefore arises of leakage occurring when there was a particular combination of circumstances at the site of puncture. In a series of 102 patients, pieces of catgut 3 cm. long were inserted at lumbar puncture into the hole left in the meninges by the needle, in order to act as plugs. The percentage of post-puncture headaches in this group of patients was especially low, being only 4.9 as opposed to 17.4 of a control series. The author also draws attention to the low manometer readings obtained at lumbar punctures performed during the actual stage of headache.

The Refractive Index of the Cerebrospinal Fluid.—Hitherto but few details have been available as to the refractive index of the spinal fluid in health and disease. The chief contributions to this problem have been made by Babes and Babes,⁵ Palmegiani,⁶ A. L. Molnar,⁷ H. P. Jones,⁸ and A. Levinson and A. M. Serby.⁹ Recent papers by W. J. Penfold and C. A. E. Price,¹⁰ and by Penfold and Irving,¹¹ embody the results of a most thorough research in this direction. Using the dipping refractometer of Zeiss under constant conditions of temperature and light, the authors studied a large number of normal and pathological fluids, with the following results: The refractive index was remarkably constant in the fluids of normal subjects, having an average value of 1.33510; the average deviation from this figure was 0.00002, and the extreme deviation 0.00006. Of seven children with normal protein content in the fluid the average index was 1.33508. An elevation of the index was found in cases of uræmia, and frequently in meningitis. A rise in the concentration of urea or glucose in the spinal fluid is associated with a rise in the index. According to the authors, if the index is not well above 1.33512, uræmia and diabetes can be excluded from the diagnosis of a patient in coma. The index is raised when there is a marked rise in the amount of protein, and may drop when there is a fall in the chloride content.

Examination of Cerebrospinal Fluid by Ultra-violet Light.—E. F. Skinner¹² has approached the analysis of cerebrospinal fluid from a new angle. From a spectroscopic study of a series of normal and pathological fluids illuminated from an incandescent copper arc, it was found that a greater

amount of absorption occurred in certain disease states. The maximum change was seen in cases of tuberculous meningitis, and also to a slightly lesser degree in general paralysis. Alterations in the spectra also occurred when fluids from cases of tabes and disseminated sclerosis were interposed. The various fluid spectra may be represented as in the author's diagram (Fig. 8).

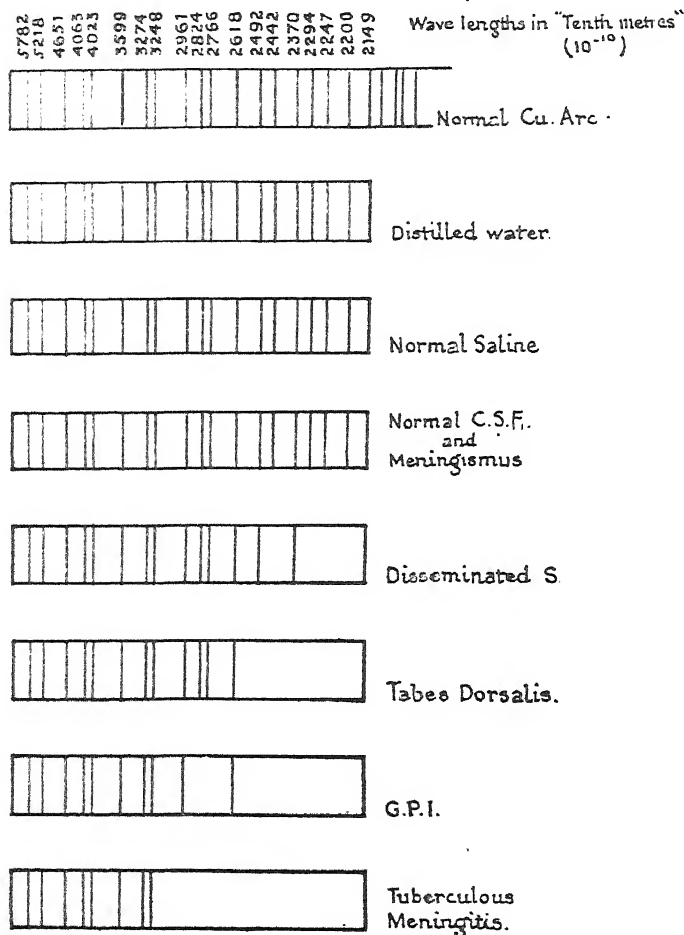


Fig. 8.—Diagrammatic representation of spectra of a series of pathological and normal cerebrospinal fluids as shown by ultra-violet light. (By kind permission of the 'Journal of Neurology and Psychopathology'.)

In his later paper, Skinner hesitates to claim marked individuality for the spectrograms of any of the conditions he investigated. In cases of meningitis of any type, there appears to be a certain selective absorption with an interval between wave-lengths of 3051 and 2764, and variations from this type appear to depend upon the natural history of the individual case.

Occurrence of Positive Wassermann Reactions in Cerebrospinal Fluid in Tuberculous and other Non-syphilitic Cases of Meningitis.—Since 1918 reports as to the finding of a negative blood Wassermann in association with a positive reaction in the spinal fluid in cases of meningitis have been made by Zadek,¹³ J. Zange,¹⁴ and others. More recent findings of a similar nature include those of K. Schaffle and M. Riesenbergl¹⁵ in eight cases of meningitis, mainly tuberculous. The question of technique is naturally one of the highest importance, as it is known that any hyperalbuminous fluid may prevent hæmolysis unless subjected to heat (56° C.) to inhibit the formation of coagula. The method adopted by Schaffle and Riesenbergl was that of Kolmer, with the single modification of incubating by means of the water-bath instead of the ice-box. It is suggested by the authors that the abundance of micro-organisms may by their presence prevent hæmolysis.

The Boltz (Acetic-anhydride) Test.—O. H. Boltz's original paper¹⁶ appeared in 1923, reporting a test on the cerebrospinal fluid which appeared to give positive results, mainly in cases of general paresis. To 1 c.c. of cerebrospinal fluid, 0.3 c.c. of acetic anhydride is added drop by drop: after shaking, 0.8 c.c. of concentrated sulphuric acid is gradually added and the mixture again shaken. The development of a lilac colour is regarded as a positive finding; pink, blue-pink, or brown colorations must be considered negative. It would appear that Boltz's test might be used as a simple and probably highly specific serological test for general paralysis of the insane. A series of papers by S. Grossman,¹⁷ J. S. Harris,¹⁸ J. P. Steel and J. E. Nicole,¹⁹ J. G. Greenfield and E. A. Carmichael,²⁰ G. L. Piotrowski,²¹ F. K. Herbert,²² and C. Thomas²³ seem to bear out this contention.

A. G. Duncan,²⁴ however, found a positive Boltz reaction in 154 out of 160 cases of mental disease, of which only 27 were suffering from general paresis, and he concludes that it is valueless as a test for general paralysis of the insane. There is no consensus of opinion as to what constituent of the spinal fluid is associated with the positive acetic-anhydride reaction; Boltz suggested cholesterol as the likely factor, and this has been tentatively supported by Greenfield and Carmichael. Most writers, however, state definitely that the test does not depend upon the cholesterol content: Piotrowski implicated a cerebroside formed by cytotoxicity of the leucocytes or of the nerve tissue; Duncan as well as Wilkinson²⁵ attributes it to the tryptophane constituent of proteins. Thomas has shown that the causal factor is resistant to heat and to post-mortem change, and he demonstrated that solutions of egg-white or diluted milk will also give a positive reaction. The test is also dependent upon slight impurities in the acetic anhydride, so that variations in the results obtained by different workers may be due to variations in the purity of this reagent.

The Colloidal Reaction of Takata and Ara.—This test was first elaborated by two Japanese workers, Maki Takata and Kiyoshi Ara,²⁶ in 1926, and is carried out as follows: To 1 c.c. of spinal fluid is first added a drop of 10 per cent solution of carbonate of soda; to this there is gradually added 0.3 c.c. of a mixture of equal parts of a 0.5 per cent solution of sublimate and 0.02 per cent non-acid Grubler fuchsin. No other spinal fluid dilution is necessary. It is claimed that by means of this reaction differentiation can be made between inflammatory processes—with increase in the albumin content—and degenerative processes in which there is an increase in the globulin only.

Although Blum²⁷ claimed a high degree of specificity for this test in cases of parasyphilis, the experience of later workers, notably E. Röhrs and E. Kohl-Egger,²⁸ S. Draganescu,²⁹ and G. Uguccioni,³⁰ suggests that though the reaction is positive in a large proportion of cases of general paralysis of the insane and

tubes, nevertheless a positive finding can also occur in other disorders. This conclusion is borne out by the recent work of Karnosh and King,³¹ who found a positive Takata-Ara test in about 82 per cent cases of metasyphilis, but also in a large number of other neurological disorders, such as cerebral tumour, trauma, and arteriosclerosis. The reaction possesses the advantage of being simpler in technique and reading than most other colloidal tests.

The Bicolour Guaiac (B.C.G.) Test.—This colloidal reaction on the cerebrospinal fluid was first elaborated by J. de Thurzo,³² and comprises an accurate and readily prepared method of investigation. The reagents include a suspension of guaiacum resin with two coloured solutions of dyes, naphthol green and brilliant basic fuchsin. Various grades of precipitation produce varying colour changes between red and green, through an intermediate grey coloration. J. G. Greenfield and R. O. Stern³³ have applied this reaction to a large series of spinal fluids in the laboratories of the National Hospital, Queen Square, comparing the result in each case with that obtained by Lange's colloidal gold test. They conclude that the B.C.G. reaction is of the same practical value as the Lange test in the diagnosis of neurosyphilis; it also gives positive results in a series of cases of disseminated sclerosis. It differs from the Lange reaction in that negative results may be obtained in spite of great protein increase. Although the B.C.G. test possesses the advantage over Lange's reaction in greater ease of preparation and greater reliability, it has two disadvantages: first, a large amount of cerebrospinal fluid (1 c.c.) is required for the test; and, secondly, it is not possible to judge the final result under twelve hours, while a fair estimate of the Lange reaction is possible after half an hour. The B.C.G. reaction appears to be more sensitive and easier to read than the colloidal mastic and benzoïn reactions.

REFERENCES.—¹*Arch. of Neurol. and Psychiat.* 1930, xxiii, 130; ²*Wien. Arch. f. inn. Med.* 1923, v, 321; ³*Jour. Amer. Med. Assoc.* 1925, lxxxv, 347; ⁴*Arch. of Dermatol. and Syph.* 1930, xxi, 615; ⁵*The Human Cerebrospinal Fluid*, Neurol. Res. Assoc., U.S.A. 1926, 321; ⁶*Rev. di Clin. Ped.* 1914, xii, 273; ⁷*Klin. Woch.* 1923, April 23, 790; ⁸*Med. Clin. N. Amer.* 1926, ix, 1115; ⁹*Arch. of Internal Med.* 1926, xxxvii, 144; ¹⁰*Med. Jour. of Australia*, 1929, Sept. 28, 424; ¹¹*Ibid.* 1930, June 14, 772; ¹²*Jour. Neurol. and Psychopathol.* 1929, x, 67; *Ibid.* 1930, xi, 144; ¹³*Munch. med. Woch.* 1918, 1435; ¹⁴*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* 1927, xvii, 235; ¹⁵*Amer. Jour. Med. Sci.* 1929, Nov., 632; ¹⁶*Amcr. Jour. Psychol.* 1923, iii, 111; ¹⁷*Jour. of Ment. Sci.* 1925, lxxi, 439; ¹⁸*Brit. Med. Jour.* 1926, i, 136; ¹⁹*Brit. Jour. Ven. Dis.* 1926, ii, 243; ²⁰*Jour. Neurol. and Psychopathol.* 1927, vii, 229; ²¹*Brit. Med. Jour.* 1929, ii, 457; ²²*Ibid.* 953; ²³*Jour. of Ment. Sci.* 1930, lxxvi, 271; ²⁴*Ibid.* 1927, July, 419; ²⁵*Brit. Med. Jour.* 1929, ii, 1221; ²⁶*Ueber eine neue kolloide-chemische Lignorreaktion und ihre praktischen Ergebnisse*, 1926 (Geibumsha, Tokio); ²⁷*Zeits. f. d. g. Neurol. u. Psychiat.* 1927, ex, 564; ²⁸*Deut. Zeits. f. Nervenheilk.* 1928, ci, 1; ²⁹*Ann. de Méd.* 1928, xxiii, 747; ³⁰*Riv. di Patol. Nere. e Ment.* 1928, xxxiii, 306; ³¹*Arch. of Neurol. and Psychiat.* 1930, xxiv, 743; ³²*Brain*, 1929, lii, 196; ³³*Lancet*, 1930, ii, 339.

CERVICAL GLANDS, ENLARGEMENT OF. (See NASOPHARYNX, ENDOTHELIOMA OF.)

CERVICITIS. (See UTERUS.)

CHANCROID.

Col. L. W. Harrison, D.S.O.

W. Frei,¹ in drawing the attention of Berlin practitioners to the existence of climatic bubo or lymphogranulomatosis inguinalis, points to the possibility of its confusion with the bubo of chancroid or with granuloma inguinale. In lymphogranulomatosis inguinalis the inguinal glands are the principal sites of the swellings, which are multiple and in places may go on to suppuration with fistulous formation, suggesting either chancroidal bubo or tuberculous. In a large percentage of cases the iliac glands swell and may be felt as quite large nodules so closely adherent to the pelvis as to be mistaken for tumours.

Confusion with chancroid may be favoured also by the fact that lymphogranulomatosis inguinalis is a venereal disease, occurring only in sexually mature persons, often simultaneously in both or more partners, and is associated with erosions, superficial ulcerations, or small papules on the genitals.

In cases of doubt recourse may be had to an intradermal inoculation with **Frei's Antigen**, which is made by aspirating the contents of a softened bubo, diluting with saline (1-5), and adding phenol (0.5 per cent). In a true case of lymphogranulomatosis inguinalis injection of this antigen is followed in about two days by a strong papular reaction which is not given by cases of chancroidal bubo or of granuloma inguinale. On the other hand, cases of chancroidal bubo give a skin reaction after intradermal injection of an antigen prepared by Frei's method from the contents of typical chancroidal buboes, or by the method of Ito and Reenstierna from cultures of chancroidal virus. An occasional consequence of lymphogranulomatosis inguinalis in the form of elephantiasoid changes, with chronic ulceration of the genitals and rectum called by the French 'esthiomène', may erroneously be attributed to chancroid, but its connection with lymphogranulomatosis inguinalis has been established on clinical and biological grounds, and cases of this disease give an intradermal reaction with lymphogranulomatosis inguinalis antigen, but not with chancroidal.

Granuloma inguinale may also be mistaken for chancroid, and probably most cases occurring in this country are so treated until their intractability leads to further investigation and a trial of specific antimicrobial treatment.

TREATMENT.—H. Sweidan² recommends for chancroid that the prepuce should be retracted and kept so in spite of the resulting œdema. The cleansing is carried out by directing, with an atomizer or spray, a strong single jet of **Hydrogen Peroxide** on the ulcer, paying particular attention to the undermined edges. After pus has been loosened as much as possible by this means, **Eusol** lotion is similarly sprayed on the ulcer, which is then swept with a camel-hair brush and again sprayed. It is then swabbed with pledgets soaked in **Tr. Iodi Mitis**, after which a piece of sterile gauze is laid on for twelve hours. If at the end of this time pus is still present, the cleansing by spraying, etc., is repeated. When the ulcer is clean it is painted with sterilized 10 per cent solution of **Tannic Acid**. A white coagulum forms, which is left exposed to the air. It soon changes to a brown crust, which in favourable cases drops off in one to three weeks. If bubo threatens, the crust is removed and eusol soaks are applied. After this **Omeisan**, which consists mainly of sodium boroformate, is dusted on, but washed off and replaced every two hours at first, then every four hours for two days. The powder must be applied also under the edge. Omeisan is also used for application to places where it is difficult to get the tannic acid coagulum to settle, such as where the paraphimosis constricts and in the coronal sulcus. Ulcers at the urethral orifice are treated with an ointment of 1 per cent **Mercurochrome-220** in equal parts of lanolin and vaseline.

H. J. Gordon³ recommends **Rosenwald's Method** of treatment. After the ulcer has been cleansed, a thin piece of cotton-wool soaked in the following: Calomel, 1 oz.; zinc sulph., 2 oz.; camphorated tincture of opium, 2 oz.; lime-water 8 oz., is applied, being retained by a condom. At the end of twenty-four hours Rosenwald's ointment—zinc oxide, starch, boric acid, and green camphor, of each 1 part; 3 per cent carbolic vaseline, 12 parts—is applied.

A. F. Lassen⁴ believes that a specific **Vaccine** in conjunction with local treatment gives the best results.

REFERENCES.—¹*Med. Klin.* 1930, xxvi, 305; ²*Jour. Med. Assoc. S. Africa*, 1929, Aug. 24, 461; ³*Urol. and Cutan. Rev.* 1929, April, 233; ⁴*Ugeskr. f. Læger*, 1929, Sept., 26, 817.

CHEST, SURGERY OF. (See EMPYEMA; HEART AND PERICARDIUM, SURGERY OF; LUNG, ABSCESS OF; LUNG AND MEDIASTINUM, TUMOURS OF; TUBERCULOSIS, PULMONARY, SURGICAL TREATMENT.)

CHICKEN-POX.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—A. Martin,¹ dealing with the *joint complications* of varicella, states that articular, peri-articular, or para-articular complications may develop in convalescence or more rarely in the first few days of the disease. During the last ten years he has seen 3 cases of suppurative arthritis of the knee, 4 of suppurative myositis of the biceps, supinator longus, and gluteus maximus, 2 of suppurative bursitis, and 1 of suppurative synovitis occurring in varicella. In the three cases in which a bacteriological examination was made streptococci were found.

A. H. Bissell² reports a case of varicella complicated by *thrombosis of the external iliac artery* in a girl of 8, who on the fifth day of mild chicken-pox complained of severe pain just above the left inguinal region and in the upper part of the left thigh. An area of gangrene rapidly developed in the left inguinal region and was excised, exposing the pyramidalis and rectus on the inner side of the cavity and the external and internal oblique laterally. The thrombosed external pudic artery and vein could be seen ending in the gangrenous area. Recovery took place in about five weeks.

A. D. Kaiser and W. L. Bradford³ describe the first case to be recorded of *hæmoglobinuria* occurring in connection with varicella. The patient was a boy, age 2½ years, who developed hæmoglobinuria in the incubation stage six days before the appearance of the eruption. The Wassermann reaction was persistently negative. The writers attribute the complete recovery which took place to **Blood Transfusion**.

Cases of *encephalitis* following varicella are reported by C. E. Conrad⁴ in a boy of 4, and by S. Graham⁵ in boys of 3 and 6 respectively. All terminated in complete recovery, as has so far been the invariable rule in encephalitis complicating varicella.

R. Rendu⁶ reports a case of chicken-pox complicated by *cerebellitis* in a girl of 6, the subject of bilateral otorrhœa since measles at the age of 3 years. In convalescence from varicella the child developed a syndrome characterized by intense vertigo with astasia-abasia, nausea and vomiting, torpor, prostration, disturbance of speech, and slowing of the pulse. The symptoms suggested cerebellar abscess, but complete recovery took place without operation a fortnight later. Bertoye and Garcin⁷ report a similar case in a girl of 3½ who also made a complete and spontaneous recovery within a fortnight.

A very rare complication of varicella in the form of *polyneuritis* is reported by F. Fasella⁸ in a boy of 6 with a negative personal and family history. Seven days after a moderate attack of varicella he had a recurrence of fever and very severe symmetrical pain in the lower limbs. On examination complete paralysis of the lower limbs with abolition of the knee- and ankle-jerks was found, as well as acute tenderness in the sciatic and anterior crural nerve-trunks. The symptoms subsided in a few days, and then the upper limbs became similarly affected. Very rapid improvement, however, took place, and the paralysis disappeared in a week's time without leaving any trace.

A. Salvadei⁹ examined the *blood* of 16 cases of varicella, 5 of which were complicated by whooping-cough during the first twenty-four hours of the disease, with the following results. Both in the pure cases and in those complicated by whooping-cough there was absolute leucopenia, neutropenia, and relative lymphocytosis, which were almost constantly associated with an increase of the basophils and a diminution of the acidophils.

INFECTIVITY.—According to J. E. Gordon and F. M. Meader¹⁰ in the prodromal stage chicken-pox is apparently infectious for only a short period, and probably for not more than twenty-four hours before the appearance of the eruption. Like F. H. Thomson they found that the infectivity is less than is generally supposed, probably ceasing within ten days, and does not necessarily coincide with the persistence of scabs.

PROPHYLAXIS.—Gordon and Meader¹⁰ found that **Convalescent Serum** furnished a high degree of protection (in 15 out of 16 cases) if obtained within a month of the appearance of the eruption, the dose being 10 c.c. of a pooled serum. Serum obtained from two to four months after the eruption was less satisfactory, and after five months conferred protection in only a third of the susceptible individuals.

REFERENCES.—¹*Paris méd.* 1920, ii, 72; ²*Arch. of Pediatrics*, 1920, 588; ³*Ibid.* 571; ⁴*Ibid.* 717; ⁵*Arch. of Dis. Child.* 1930, v, 146; ⁶*Jour. de Méd. de Lyon*, 1929, 767; ⁷*Lyon méd.* 1929, cxliv, 661; ⁸*Policlínico* (Sez. Med.), 1929, 566; ⁹*Clínica Pediatrica*, 1929, 1050; ¹⁰*Jour. Amer. Med. Assoc.* 1929, xciii, 2013.

CHILDREN, INTRAPERITONEAL THERAPY IN.

Reginald Miller, M.D., F.R.C.P.

C. G. Grulee and H. N. Sanford,¹ in advocating intraperitoneal therapy in infants and children, point out, quite legitimately, that in many conditions where the supply of fluids or urgent medication is most needed oral and rectal administration may be impossible, and intravenous or subcutaneous administration difficult or inefficient. They claim that the intraperitoneal route allows greater quantities of fluid to be given, with greater safety and less reaction than other routes, and compared with the intravenous route has the great advantage of permitting frequent repetitions of the treatment. The disadvantages of the method are slight, chiefly a somewhat slower absorption, especially in the case of the red blood-cells in intraperitoneal blood transfusions. The dangers of the method consist in possible sepsis, abdominal distension from too large an amount being delivered at once, and reactions due to improper preparation of the material injected.

Intraperitoneal injection of **Normal Saline** was used in cases of infantile diarrhoea by Blackfan and Maxey² in 1918, and has been fairly widely employed. Later the use of **Dextrose** solution was recommended as preferable, but severe reactions, varying from fever and distension to cyanosis and death, were soon reported (Maches³). This was found to be due to acidity developing in the solution on autoclaving (Williams and Swett⁴), and can be obviated by autoclaving the dextrose dry and dissolving in distilled water. Using a 5 per cent solution of dextrose prepared in this way the authors have experienced no difficulty, but advise that not more than 100 c.c. be injected at one time, and that the amount be correspondingly reduced in the case of small infants. The authors have also used intraperitoneal blood transfusions, but state that the intravenous method, when available, is here to be preferred. They have had successful experiences with the administration of **Arsenical Compounds** in congenital syphilis, and of **Iron** (5 c.c. of colloidal iron twice a week) in secondary anaemia. **Diphtheria Antitoxin** has been given by the intraperitoneal route by Fonde,⁵ Goehle and Dauer,⁶ Platou,⁷ and in 168 cases of diphtheria by Toomey, Goehle, and Dauer.⁸ The reports here are good, the absence of reactions being particularly emphasized, but Grulee and Sanford claim no personal experience with such use of diphtheria antitoxin.

REFERENCES.—¹*Arch. of Dis. Child.* 1930, v, 371; ²*Amer. Jour. Child. Dis.* 1918, xv, 19; ³*Münch. med. Woch.* 1921, lxxviii, 1082; ⁴*Jour. Amer. Med. Assoc.* 1922, lxxviii, 1024; ⁵*Internat. Clinics*, 1917, iii, 198; ⁶*Cent. States Ped. Assoc.* 1921; ⁷*Arch. of Pediatrics*, 1923, xl, 575; ⁸*Amer. Jour. Child. Dis.* 1925, xxix, 214.

CHILDREN, MEDICAL DISEASES OF. (*See* ANÆMIA IN INFANTS AND CHILDREN; ANOREXIA. CONGENITAL; ASTHMA IN CHILDREN; CHOREA; GAUCHER'S SPLENOMEGALY IN INFANCY; HEREDITARY ECTODERMAL DYSPLASIA; HYPERPYREXIA IN EARLY INFANCY DUE TO ATROPINE; JUVENILE AFFECTIONS, DIATHESIS IN; NEW-BORN, HÆMOGLOBINURIA IN; RICKETS.)

CHILDREN, SURGICAL DISEASES OF. (*See* APPENDICITIS AND PERITONITIS IN CHILDREN; FOOT, SURGERY OF; HARE-LIP AND CLEFT PALATE; OSTEOMYELITIS; PYLORUS, CONGENITAL STENOSIS OF; RECTUM, PROLAPSE OF.)

CHOKED DISC. (*See* BRAIN, TUMOURS OF.)

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EXPERIMENTAL.—L. Arnold and Shapiro¹ report experimental infections of rabbits with the cholera vibrio, in which they found that the organisms injected into the duodenum only produced choleraic diarrhoea if given in alkaline-buffered phosphate solution.

PROPHYLACTIC INOCULATION.—G. Jolly and others² report on the value of inoculation against cholera in the Meiktila district of Burma in 1928 with an attack-rate of 4.13 per cent and a death-rate of 3.06 among 230,933 non-inoculated population, against 0.76 and 0.76 in 50,096 inoculated persons—showing 5.43 times the attacks and 4.03 times the mortality among the non-inoculated. Moreover, 10 and 7 of the attacks occurred on the first and second day after inoculation out of 38 among the inoculated. In the headquarters town of the district the results were even more striking, for among 2360 non-inoculated the attack-rate was 12.71 per cent and the death-rate 5.08, against no attacks or deaths in the inoculated. These figures only confirm scores of equally successful inoculations reported in recent years in India.

TREATMENT.—

Bacteriophage Inquiries.—The promising results of the use of **Bacteriophage** in the treatment of a few cases of cholera in Calcutta and in the Punjab were reported by F. D'Herelle and R. H. Malone in previous issues of the *MEDICAL ANNUAL* (1929, p. 101; 1930, p. 122). These investigations have been published in great detail in a memoir of 161 pages by the same workers.³ They now reject the Calcutta results on the curious plea that tests of bacteriophage treatment in a hospital are of no value, but they rely on a death-rate of 8.1 per cent in 74 Punjab village cases treated with bacteriophage orally, while 124 control untreated cases showed a death-rate of 62.9 per cent. Unfortunately their tables show that most of the control cases were early ones, when the mortality is always much higher than later in the same outbreak, and that at least two rapidly fatal cases were attacked and died during the night when treatment could not be applied, and so were excluded from the treated list. Nevertheless, the figures are very encouraging and receive support from those of J. Morison given below. The present report greatly amplifies the theoretical aspects and details of the investigation, on the basis of which very remarkable claims are made; but the persistent disparagement throughout the volume of practically all previous work of the last half century on bacteriology, inoculation, immunology, and treatment of cholera does not inspire confidence in the judgement of the writers, the first-named of whom appears to be mainly responsible in the matter. The memoir is, however, a most valuable and suggestive one, but space only permits a few of the more practical conclusions to be noted in amplification of the brief account in the 1930 *MEDICAL ANNUAL*.

It was mentioned there that bacteriophages are considered to be ultramicroscopical living organisms which prey on and destroy or render non-pathogenic the virulent cholera vibrios which cause the disease, but which can regain their virulence in a short time in the human bowel in the absence of bacteriophage, or they may remain for very long periods in symbiosis with bacteriophage in an avirulent form, with the production of some degree of protection of the carrier, if they resist the action of the bacteriophage, when they are regarded as 'secondary cultures'.

Bacteriophages are classed as Nos. 1 to 10 in proportion to their strength, and only Nos. 9 and 10 are sufficiently powerful to be used in treatment, as they can rapidly destroy all the virulent vibrios in a culture. All former work on cholera toxins is set aside as valueless, and it is claimed that the toxic symptoms are due solely to the secretion by the virulent cholera microbe alone of "enzymes capable of digesting the living substance of the cells" of the mucous membrane of the small bowel and of hæmolyins; hence the only possible treatment of any value is an intestinal bacteriophage "which adapts itself rapidly to parasitism for the invading vibrio". The destruction of cholera toxins in the lumen of the bowel by such a drug as permanganate is dismissed as useless, because the authors hold that only the microbes in the mucous membrane are harmful, and that the drug cannot reach them there. In their former paper they advocated the saline treatment to prolong the life of the patient in order to allow the bacteriophage time to act; they now dismiss it as useless on the extraordinary ground that good results have only been obtained in Calcutta! [Have they never heard of the still better results obtained in China?—L. R.] They found that injections of bacteriophage in addition to its oral use yielded much inferior results in a few cases to oral administration alone, and they attribute this to an injection of cholera toxins with the bacteriophage. In the third part of the memoir the epidemiology of cholera is discussed, and the authors attribute "the cessation of epidemics to the diffusion from convalescents of bacteriophages adapted to effect the bacteriophagy of cholera vibrios", and consider that "it is possible to reproduce this process experimentally by sowing selected cultures of bacteriophages in the wells of infected villages". Finally they suggest "vaccination against cholera by the subcutaneous injection of vibrio cultures dissolved by the action of the bacteriophage", and think the toxin in it would be harmless in a patient not already suffering from cholera; but they reject all the evidence in favour of anticholera vaccination now in general use, and dogmatically assert that "the history of past and recent epidemics shows its influence to be nil".

I. N. Asheshov (formerly D'Herelle's assistant, who has taken on his investigations in India) and his assistants¹ record important modifications of the earlier conclusions, as they now find three types of cholera bacteriophages—A, B, and C—each of which fails by itself to destroy the whole of a virulent cholera culture, for some survive as secondary cultures; but the third will destroy the survivors resisting the action of the other two, so that all three must be present to be effective against the cholera vibrios, which complicates matters. Mixtures of all three have been tried as a prophylactic by addition to the water of wells at Puri in amounts of 50 c.c., with the result that the incidence of cholera in the treated area was only a tenth of that outside it. On the other hand, experiments with the triple bacteriophage treatment of cholera cases at Puri were unsuccessful, even when administration took place in the early stage of the disease, either orally or by intravenous injection, and treatment results were also unfavourable until careful control was established in Patna Medical College Hospital, when good results were obtained, but alkaline and saline infusions were also necessary to ensure these. Accordingly they think "the

main rôle of the bacteriophage will be not in the treatment of cholera, but in its prevention".

J. Morison and his assistants⁵ report on a successful trial of the bacteriophage treatment in a village in the Khasia Hills of Assam, with 80.8 per cent mortality without, and 10.8 per cent with, bacteriophage treatment; or if only the cases seen after the bacteriophage was available are taken, to avoid the fallacy due to the greater virulence during the early part of an outbreak, 12 of 13 died without bacteriophage (an extraordinarily high mortality for a village outbreak, so of very doubtful value in such a small series), and 7 out of 59 of those who received bacteriophage. Prophylactic inoculation was also used, and the outbreak did not cease until the fourth day after this was completed, and eleven days after the arrival of bacteriophage, so it is very doubtful if the bacteriophage had much effect in bringing the outbreak to an end. No nursing was available and salines were given in only five cases. The above work is also discussed in an editorial in the *Indian Medical Gazette*,⁶ and further investigations are advocated, which should be of great interest and importance.

J. Taylor, S. D. S. Greval, and U. Thant⁷ report on a trial of bacteriophage treatment of cholera with controls in the Rangoon Isolation Hospital. They failed to confirm any of the claims of D'Herelle and Malone, for the death-rate in the controls was 53 per cent and in the treated 57 per cent, while there was no relationship between the development of bacteriophage in the stools and recoveries, which were quite independent of phage action, in spite of the phage used being very active against laboratory cholera vibrios; therefore they conclude that the treatment was useless.

S. C. Mukherjee⁸ reports treatment in three small series of cases of cholera, from which he concludes that the use of 5- or 6-gr. doses of **Calcium Chloride**, in the place of 4 gr. to the pint in **Rogers's Hypertonic Salines**, is advantageous.

REFERENCES.—¹*Ind. Med. Gaz.* 1930, Sept., 496; ²*Ibid.* 1929, Nov., 618; ³*Ind. Jour. Med. Research*, Memoir 14, 1930, Feb.; ⁴*Ibid.* Jan., 971; ⁵*Ind. Med. Gaz.* 1930, March, 121; ⁶*Ibid.* Feb., 91; ⁷*Ind. Jour. Med. Research*, 1930, July, 117; ⁸*Ind. Med. Gaz.* 1930, Sept., 498.

CHOREA.

Reginald Miller, M.D., F.R.C.P.

Nirvanol Treatment.—The nirvanol treatment of chorea was first undertaken in Germany by F. Roeder¹ in 1919. The first English report on it was published in 1929 by F. J. Poynton and B. Schlesinger.² Various workers in different countries have reported on its use, and the subject was dealt with in the *MEDICAL ANNUAL* of 1930 (p. 123). A paper recently published by O. R. Tisdall³ takes us a little further in this matter, for the results in a comparatively large number of cases of chorea in children are given, and these contain eleven cases already published by W. M. Whittaker,⁴ whose after-histories are now supplied.

Nirvanol is a drug closely allied to luminal which is given orally in tablet or powder form in a daily dose of 0.3 grm. After a time, usually between seven and twelve days, there occurs in most cases a reaction known as 'nirvanol sickness'. This consists most commonly of a rash, pyrexia, and an eosinophilia, to which may be added headache, drowsiness, conjunctivitis, and more rarely vomiting, adenitis, œdema of the eyelids, and diplopia. The change in the blood may be the only sign of the reaction, so that daily blood-counts should be undertaken while the treatment is being given. With the onset of the symptoms of the reaction, the administration of the nirvanol is stopped.

Tisdall gives the results of this treatment in 29 cases of chorea in children. Taking arbitrarily the period of six weeks as a test of efficiency, he found, out

of 29 cases, 15 were cured within that time, 9 were markedly improved, and 5 were not improved. It cannot be said that these figures are very impressive; nevertheless they are only figures, and they are somewhat artificial in that they are based on an artificial time-limit of six weeks. The author's personal impression was that the immediate results were good, especially in severe cases. The after-results, as the author admits, are disappointing; of the 15 cases cured within six weeks, no fewer than 6 relapsed within five months. It seems probable, therefore, that in treating chorea with nirvanol there is no evidence of any eradication of the rheumatic infection in the individual case, and the line of treatment is no more than the exploitation of a new sedative whose superexcellence has yet to be proved.

In what, then, lies the particular interest of the use of nirvanol in chorea? In the first place undoubtedly in the fact that the treatment is novel. It is not necessary to be very far advanced in 'the sere, the yellow' stage to be able to recall the enthusiasm with which the introduction of other sedatives has been hailed in the treatment for chorea, and the present writer must confess to a considerable weakness towards the use of **Adalin** (Bayer) in this condition. But probably the chief interest in connection with the use of nirvanol lies in the fact that this drug is not only a sedative, but also has the power of producing a peculiar 'reaction' with greater constancy than other such drugs, and that it is thought that the 'reaction' rather than the sedative action itself is the curative factor in the treatment. Were this so, it would be of undoubted interest at the present time, when the possibility of an allergic sensitivity being responsible for rheumatic symptoms is being so much discussed. Tisdall's results do not give any very definite promise that such a theory will be substantiated. Although improvement in chorea sets in as a rule within a week of the 'reaction', 12 out of the 29 cases reacted without being 'cured' (i.e., well in six weeks). The high proportion of relapses after treatment is again not encouraging, neither is the fact that a normal child used as a control who showed an ordinary nirvanol reaction developed 'somewhat disconcertingly' a first attack of chorea six months later.

In Tisdall's cases the administration of nirvanol caused no symptoms giving rise to anxiety, yet the use of the drug cannot as yet be said to be free from risk. Tisdall writes on this point: "There are definite risks to be encountered in the use of nirvanol, and it is undoubtedly a drug which should be used with caution, and under careful supervision." When it is remembered that chorea, however long it may last, will ultimately get completely well, there is a grave objection to the use of any measure involving a risk unless it can be shown to be exerting an antirheumatic action and not merely damping down choreic symptoms.

On the whole, therefore, the evidence in favour of the use of nirvanol in chorea does not as yet seem sufficiently strong to make it likely that it will prove to be a distinct advance in the treatment of this condition or even outlive the popularity due to its novelty. On the other hand, the fact that its curative properties, such as they are, may be due to a peculiar constitutional 'reaction' is full of interest and may perhaps lead in time to something more effective.

REFERENCES.—¹*Therap. Monats.* 1919, xxiii, 54; ²*Lancet*, 1929, i, 267; ³*Arch. of Dis. Child.* 1930, v, 397; ⁴*Ibid.* 44.

CIRRHOSIS OF LIVER. (See LIVER, SURGERY OF.)

CLEFT PALATE. (See HARE-LIP AND CLEFT PALATE.)

CLUB-FOOT. (See FOOT, SURGERY OF.)

COAGULATION OF BLOOD. (See PRE- AND POST-OPERATIVE TREATMENT.)**COCCIDIOIDAL GRANULOMA.** (See also SKIN, FUNGUS INFECTIONS OF.)
Ivor J. Davies, M.D.

W. T. Cummins (San Francisco), J. K. Smith (Bakersfield, Cal.), and C. H. Halliday (Baltimore)¹ present an epidemiological survey of coccidioidal granuloma with a report of twenty-four additional cases. The fact was established that there has been a regional development of cases of this disease in California, although infection has occurred in other states and in South America. The confusion of coccidioidal disease with blastomycosis and tuberculosis is real. It is a disease of both animals and man resembling tuberculosis, but caused by its own specific fungus, *Oidium coccidioides*. For the diagnosis of coccidioidal disease, the double-contoured, endospore-forming cell must be found in pus (or fixed tissue), with the characteristic cultural manifestations, and confirmed by inoculation in male guinea-pigs.

D. S. Pulford and E. E. Larson² (Woodland, Cal.) report a case and a review of previous contributions.

N. Evans and H. A. Ball³ (Los Angeles) submit an analysis of fifty cases of coccidioidal granuloma. The majority of the cases occur between the ages of 20 and 40. Males predominate over females, 41 to 9. The majority of the patients have contact with soil or animals, either directly or indirectly. It is the authors' impression that there are three main clinical types of patients:—

1. Patients whose pulmonary infection is heavily implanted, the pathological process being extensively pulmonary, and who usually die before many or extensive somatic lesions have time to develop.

2. Patients whose pulmonary infection is moderately implanted, who many times have pulmonary symptoms to which little attention is paid, but who develop multiple somatic lesions in which the organisms multiply and which become extensive with consequent blood-borne return infection to the lung, taking the form of miliary involvement, the duration of life usually varying around the average of this series—that is, nine months.

3. Patients in whom the pulmonary infection is very lightly implanted, who develop but one or two somatic lesions to which the body reacts to a degree that heals the lesion or causes it to become very chronic, such cases lasting for years or until resistance is so lowered that a lesion of sufficient activity can develop to cause a miliary pulmonary involvement.

H. P. Jacobsen⁴ (Los Angeles) makes further observations on coccidioidal granuloma, with a report of seven additional cases. It is a much more prevalent disease than the comparatively limited number of reported cases would seem to indicate. While the disease under consideration may especially mimic tuberculosis in its various clinical forms, it may also simulate other clinico-pathological entities, as evidenced by one of the cases alluded to above which presented a condition simulating a lumbosacral neoplasm. The combined treatment with **Colloidal Copper**, **Coccidioidin B** (endo- and exotoxin), and, when feasible, **Carbon-dioxide Snow** is superior to the treatment with copper alone.

Blastomycosis.—G. D. Maner and R. W. Hammack⁵ (Los Angeles) report two cases of systemic blastomycosis. The term 'blastomycosis', in its broad sense, includes all disease caused by yeast-like fungi—that is, fungi which appear in the lesions as round or oval cells, sometimes budding, but usually without mycelium. These fungi are generally called blastomycetes, and include members of several genera. However, in America the tendency has

been to restrict the term 'blastomycosis' to infection with *Blastomyces dermatitidis* (Gilchrist and Stokes).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1929, Oct. 5, 1646; ²*Ibid.* 1940; ³*Ibid.* Dec. 14, 1881; ⁴*Med. Jour. and Record*, 1929, Oct. 16, 424; Nov. 6, 498; ⁵*California and West. Med.* 1930, Feb., 87.

COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

In this disease the ulcers usually appear first in the rectum and extend upwards, but in a few cases, as J. A. Barga and H. M. Weber¹ have shown, the rectum is normal and the ulceration is confined to a higher part of the colon. This they speak of as 'regional, migratory ulcerative colitis'. It can only be diagnosed radiologically. The symptoms consist of intermittent attacks of diarrhoea and severe cramping pains. Hæmorrhage may occur and be profuse. The X-ray appearances are narrowing and shortening of the bowel, with marked hyper-irritability, loss of haustration, and signs of destruction of the mucosa.

TREATMENT.

H. L. Tidy² recognizes no distinction between catarrhal and ulcerative colitis. The treatment is the same, and needs the most careful attention to detail. He describes it as follows:—

General Measures.—Direct applications to the lower bowel are the basis of treatment, but there are certain general points which are of great importance.

Warmth.—It is essential that the patient should be kept warm in order to diminish loss of heat from the body. The extremities are often cold. Owing to the long duration it is usually impossible to keep the arms under the bed-clothes. A light woollen jacket extending to the wrists should be worn, with stockings or long socks with pyjamas. Hot-water bottles and plenty of blankets should be provided. Patients frequently assert that they do not feel cold, but they usually soon appreciate the benefit of additional warmth.

Fluid.—Fluid must be given in considerable amounts to repair the loss from the body. One to two ounces may be given every twenty to thirty minutes between meals. Any bland fluid is suitable, such as lemonade, weak tea, or soda-water. Alcohol must not be given in any form.

Diet.—It is of the greatest importance that the patient should get sufficient nourishment. There is no doubt that in this condition more patients are underfed than overfed, and many are definitely starved. The stomach and small intestine are little affected and can digest considerable amounts, provided that the diet is plain and the method of preparation is suitable. Food should be given at intervals of not longer than two and a half hours. Bread or toast, biscuits, butter, eggs, fish, meat jellies, and meat extracts may be used freely. Custard, Allenburys and simple foods, and simple milk puddings are suitable, but milk must not be used as a beverage or taken too largely. Grapes and orange-juice should be given. Fats must be used in moderation apart from fresh butter. Meat is unnecessary and must not be given. With regard to vegetables, their harm depends greatly on the method of preparation; small quantities of carefully prepared purées of spinach or potato can often be given in the later stages without ill effects. They should be used principally to relieve the tedium of a diet, when this is beginning to cause loss of appetite. Attempts to force the amount of food unduly or the administration of heavy dishes will disturb the stomach and result in anorexia and nausea, a most serious complication.

Treatment by Enemata and Colonic Washes.—Direct treatment of the colon is the essential method of attacking catarrhal colitis. The greatest care,

patience, and attention to detail are necessary in the procedure. It is easy to do more harm than good, and the tendency to do too much and in too great a hurry must be resisted.

There are three main types of enemata, and these roughly correspond to progressive stages. They are: (1) The starch and opium enema; (2) Simple colonic wash; (3) Medicated enema. The method of preparation and administration will be first described.

1. *Starch and Opium Enema*.—The mucilage of starch which forms the basis is prepared as follows: Half an ounce of starch is rubbed to a smooth paste with 4 oz. of water; 16 oz. of water are raised to the boil, the starch paste added, the mixture raised to the boil again and allowed to cool. The amount of mucilage used for a patient of ordinary size and weight is 3 oz.; for a small woman 2 oz. is sufficient; and for a large man 4 oz. may be used, but this is the limit. The amount of tincture of opium added is in general 20 to 40 min., but the dosage will be referred to again later. The injection is given through a soft No. 10 rubber catheter attached to a glass funnel. The catheter is passed not more than three inches and the enema allowed to flow in. The patient is encouraged to retain it as long as possible.

2. *Simple Colonic Wash*.—This may be prepared with sodium chloride, 1 drachm to a pint of water, or sodium bicarbonate, 2 drachms to a pint. Two pints are used for a patient of average size; the temperature should be 98° to 99°, which will be somewhat less than that of the colon. The injection should be given through a rubber catheter as for the starch and opium enema. The fluid must flow in solely by the force of gravity, the container being held not more than a foot above the anus. The rate of flow should be a pint in fifteen to twenty minutes. These points are of great importance in order to avoid irritating or stimulating the intestine. The patient may lie on his back; in this position two pints of fluid will easily reach the cæcum. There is no need to move the patient from side to side. He should be encouraged to return the wash after an interval of fifteen minutes if this has not already occurred, and may be sat up in bed. No other steps should be taken. As these patients are usually short of fluid, no harm is done by its absorption, though its benefit as a wash is lost. In no case should any attempt be made to recover the fluid by the passage of a 'long rectal tube'.

3. *Medicated Enema*.—This is well prepared with **Albargin**. The modern preparation seems to be more powerful or more irritating than formerly. It is best to commence with 20 gr. of albargin in 30 oz. of normal saline; subsequently the strength may be increased to 30 gr. Of this 25 oz. is used for the patient of average size. It must be injected very slowly through a rubber catheter and glass funnel. A simple colonic wash must be given first; unless at least half its volume is returned the administration of the medicated enema must be abandoned for the day. If the wash is returned satisfactorily, the medicated enema is given two hours after the wash was commenced. Convenient hours are at 9 a.m. and 11 a.m. respectively.

These various enemata correspond approximately to stages in the treatment.

STAGE I: *Starch and Opium Enema*.—When the patient first comes under observation, treatment should commence with starch and opium enemata. The effect of an enema lasts not more than twelve hours. It should first be given at night in order to obtain rest and sleep. It must not be given on more than three days consecutively, or more than five times a week. If the treatment is hastened, the rectum and anus become irritated and the injections cannot be endured, and at a critical time this may necessitate the treatment being abandoned for a week or more. Throughout the entire period of treatment, both in this and subsequent stages, no attempt must be made

to hurry the progress by increasing the frequency of the injections. It is essential for the medical adviser to adhere firmly to this, in spite of entreaties and his own desire for more rapid improvement. A few evening injections will reduce the number of stools at night. After an interval of a day, two or three injections are then given in the mornings in order to reduce the number by day. During this period the stools usually tend to increase again at night, and it will then be necessary to return to a course of evening injections. Subsequently treatment often involves giving alternate morning and evening series of two or three injections. Usually the motions at night are the more easily controlled, and the injections will mostly be given in the morning in order to control the day motions.

Quite early in the treatment an enema may result in no stool being passed for twelve hours: too optimistic an outlook must not be based on such apparent early success. It is possible that the action of these injections is mainly in allaying the irritability of the rectum; this reduces the number of motions somewhat artificially, but enables the patient to obtain some rest, and also enables the rectum and anus to endure the colonic washes in the next stage.

In severe cases toxic results may be produced by 25 or 30 min. of **Tincture of Opium**. A patient may become partly collapsed about two hours after the injection. This may be preceded by a period of excitement. If this occurs the dosage should be reduced to 10 or even 5 min., and then gradually increased. It is advisable in every case to commence with not more than 20 min. Tidy says that he has never attempted to increase beyond 40 min.

As a guide to the duration of this period, its aim may be stated as the reduction of the number of stools by half, or to about five daily. The usual time is about three weeks, but it may be considerably more.

STAGE II: Colonic Washes.—When the stools are reduced as stated, colonic washes are begun. Many patients cannot stand more than three washes a week. Consequently at the onset they should be given on alternate days. As a general rule they should not be given on more than two days consecutively. If the stools become more frequent again, a return should be made to the **Starch and Opium Enemata** from time to time.

This stage is a matter of months, and it will gradually be discovered how frequently the individual patient can bear injections. It is often a successful practice to give colonic washes and starch and opium enemata alternately, and a patient may be able to endure these daily for several weeks. At the slightest hint that the anus is becoming irritable, or that the washes are being returned too soon, their frequency must be reduced or an interval of several days allowed.

This stage aims at a reduction of the number of stools until they are consistently less than five a day. In a severe case this period will be six to eight months.

STAGE III: Medicated Enema.—The patient is now ready for medicated enemata, which may be regarded more definitely as the curative form of treatment. These enemata must never be given more frequently than on alternate days, and not more than six in a fortnight, followed by at least a week's interval.

Considerable judgement has to be used in deciding how long a patient should be encouraged to retain such an enema. An albargin enema is always uncomfortable, and in a short time often becomes distinctly painful. For the first enema a period of five minutes is as long as is advisable. This period should be increased gradually to fifteen minutes, though any time over ten minutes is satisfactory. Retention should never be allowed beyond twenty minutes. There is never any difficulty in the enema being returned.

If medicated enemata are commenced before the intestine is in a fit state, the pain will be too great to permit retention; the enemata, if persisted in, will irritate the intestine and result in an increase in the number of stools. In such circumstances they must be abandoned immediately, and a return made to the treatment of Stage II for four to eight weeks. It is nearly always advisable, after the first series of six medicated enemata, to return to Stage II for two or three weeks. Stage III will usually occupy two or three months.

Once again it may be repeated that patience is essential, and the desire to hurry progress must be resisted.

Other Forms of Medicated Enemata.—Many other forms of medicated enemata have been employed. Of these the **Tannic Acid** enema is most in use. In strength this may be regarded as intermediate between a simple colonic wash and an albargin enema. It can be commenced earlier than albargin, but is definitely less efficacious. According to Tidy it is best to wait until the colon can tolerate albargin. Tannic acid enemata, or other forms of medicated enemata, are often employed from the onset of treatment, directly the patient comes under observation. This practice must never be followed. It is associated with the disastrous mortalities so often recorded in series of cases which have been 'medically treated'.

Incontinence of Fæces.—Incontinence is a very grave symptom. Obviously it robs us of all opportunity of the use of enemata. Occasionally, though rarely, it can be controlled by a starch and opium enema. In general, incontinence must be regarded as the indication for surgical treatment.

Drugs and Other Methods of Treatment.—

Morphine.—The question of the administration of morphine needs great care and often considerable moral firmness. It is easy to paralyse the intestine by an injection of morphine or even by a large dose by the mouth. The reduction of stools is regarded by a patient and by the relatives as the essential point in treatment, especially when associated with the comfort of the narcotic action. Consequently strong pressure is often brought to achieve this result by any means. It is the duty of the medical attendant to resist this pressure. Mere paralysis of the intestine does not allay the inflammation or prevent toxic absorption from the intestine. The result, far from being satisfactory, is usually absolutely disastrous; the patient rejoices in the comfort, feels greatly improved, and resents any attempt at active treatment; meanwhile cardiac weakness and collapse progress rapidly. It may be stated as a definite rule that in no circumstances should an injection of morphine be given. By the mouth a dose of 5 min. of tincture of opium four times a day may safely be given if desired, but larger doses must not be given. Indeed, the use of morphine should be restricted to the opium in the starch and opium enema.

Drugs by the mouth, apart from morphine, appear to have very little effect in the more severe stages. In the later periods of improvement certain preparations are of assistance, and should be employed. **Mistura Cretæ** (B.P.), **Bismuth**, especially as bismuth salicylate, and **Aromatic Sulphuric Acid** are the most valuable. The maximum official dose should be given three to five times a day, and at night.

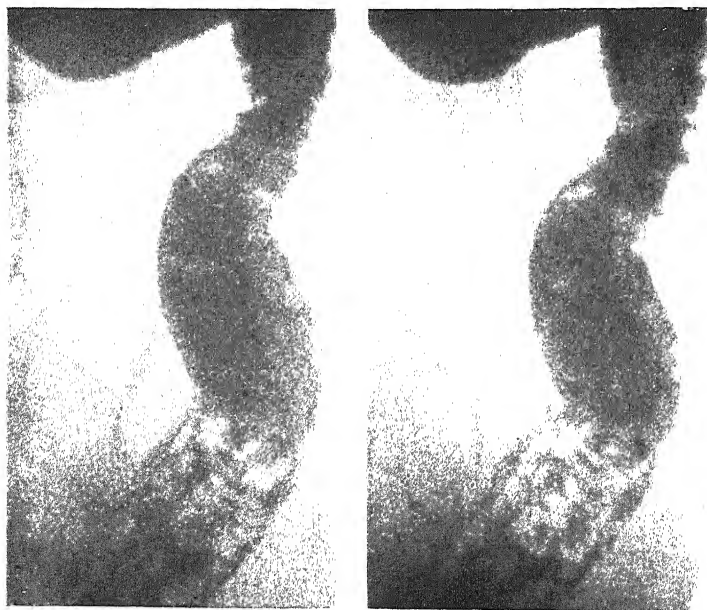
Comparative trials on a considerable scale in bacillary dysentery during the War did not suggest that these had any obvious effect during the acuter stages.

Of other drugs and preparations, Tidy recommends **Charcoal** or **Kaolin** if the stools are offensive; he says it is difficult to assess its value, but that it cannot be harmful. True antiseptics can scarcely be expected to have any useful effect in the colon in doses in which they can be given safely by the mouth. **Soured Milk** should be employed only if its proper preparation can

PLATE VIII

MULTIPLE POLYPOSIS OF COLON

G. H. ANDERSON AND O. A. MARKER



Barium enema showing portion of sigmoid colon. The illustration on the right was taken one second later than the one on the left.

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be guaranteed; in such circumstances it may be given; it does not appear to possess any value during the severer stages. Emetine is definitely contra-indicated in every form of colitis except amoebic dysentery.

Vaccines.—Neither in severe nor mild forms, nor in any stage, has the author seen any good results from the use of vaccines.

Serum Therapy.—Some observers have recorded good results from the injection of anti-dysenteric serum. Unfortunately others have failed to obtain these results. It may be noted that it is generally agreed that anti-dysenteric serum is of no use in bacillary dysentery itself after the first few days of illness, though it is effective at the onset.

Surgical Treatment.—Incontinence is a definite indication for surgical treatment unless it can be rapidly checked, and may result from injudicious treatment. Tidy contends that, apart from incontinence, he can find no reason for surgical intervention, and the results recorded are certainly not better than those of rational medical treatment. Of operations, the only one which should be performed is **Appendicostomy**.

In view of the negative results obtained from **Vaccine Treatment** of ulcerative colitis in this country, it is interesting to note that successes with a vaccine of Bargen's diplococcus continue to be reported from America. W. Z. Fradkin and Irving Gray³ used it 'with remarkable improvement' in ten out of fifteen cases, and E. and J. Horgan⁴ with 'complete relief' in every one of five cases in which it was employed. It is a curious thing that Bargen's diplococcus does not seem to be known in this country.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, June, 964; ²*Brit. Med. Jour.* 1930, i, 135; ³*Jour. Amer. Med. Assoc.* 1930, March 22, 849; ⁴*Ibid.* 1929, July 27, 263.

COLLAPSE OF LUNG. (See LUNG, MASSIVE COLLAPSE OF; PRE- AND POST-OPERATIVE TREATMENT.)

COLON, MULTIPLE POLYPOSIS OF.

Robert Hutchison, M.D., F.R.C.P.

Multiple polyposis of the colon is probably not so rare as was once supposed. The polypi may be either adenomatous or inflammatory, and as the symptoms are the same as those of ulcerative colitis the diagnosis can only be made by the sigmoidoscope or the X rays. J. H. Anderson and O. A. Marxer¹ describe two cases which show the X-ray appearances (*Plate I'III*).

In polyposis the filled bowel is studded with concave impressions on the otherwise smooth margin, and the mucosa in general presents a mottled or honeycomb appearance, probably due to only a thin coating of opaque material being present in parts, owing to displacement by the polypi. If the bowel is too distended to show this mottling, pressure with a wooden spoon or air-bag may produce it. In Anderson and Marxer's cases serial films showed some exaggeration of the lesser movements of the colon, but frequent incomplete mass movements were present with a slowing of the relaxation phase and absence of segmentation. The nodular filling defects at the margins of the filled bowel and the honeycomb appearance of the colon as a whole are the main features in excluding uncomplicated colitis. In order to elicit the appearances frequent examinations are necessary, and it is advisable to slow down the passage of the barium through the bowel by a preliminary injection of morphia.

J. Gottesman and D. Perla² also describe two cases of intestinal polyposis with references to the literature. In one case the polyposis was associated with chronic tuberculous enteritis, and in the other with malignant degeneration.

REFERENCES.—¹*Brit. Jour. Surg.* 1930, xvii, 451; ²*Amer. Jour. Med. Sci.* 1930, March, 370.

COLON, SURGERY OF.*A. Rendle Short, M.D., F.R.C.S.*

Colopecty.—E. P. Quain,¹ after pointing out that *persistent* pain in the right iliac fossa, relieved by lying down, is much more likely to be due to a dropped, dragging, distended colon than to appendicitis, advises a method of colopecty similar to what we in this country call Waugh's operation. He claims that, of 96 cases followed up one to seven years after, 84 had complete relief and only 3 no relief.

Colostomy.—C. H. Shorney Webb² writes on the after-care of a colostomy, which should be trained to act once or twice a day and not to dribble. Aperients, especially liquid paraffin, are to be avoided. The colon should be washed out daily after breakfast with plain warm water, to secure a regular morning action. The lower colon and rectum should also be washed through with water or encol. The colostomy belt is a support for the abdominal wall and a covering for the exposed mucosa, not a receptacle for faeces, and the cap should not be deep, but the dome should only be a fraction of an inch off the spur of the colostomy. The rim should be made of celluloid, not rubber, so that it can be easily kept clean. A light dressing is worn underneath it. When the patient is in bed the cup need not be worn, though a belt is desirable. If irregular actions are taking place, larger cups and bulkier dressings are necessary.

L. J. Hirschman³ advocates a median colostomy through the site of the excised umbilicus, the advantages claimed being that it is better supported by muscles, not so visible through the clothes, and keeps away from the anterior superior iliac spine: the umbilicus is removed for purposes of cleanliness. He opens the loop not by cutting or cautery, but by leaving on a crushing clamp for forty-eight hours to induce necrosis. [In our experience median colostomy, which usually means opening the transverse colon, is apt to be followed by prolapse.—A. R. S.]

Cancer of Colon.—Sixteen cases of multiple primary cancerous growths of the colon are reported from the Mayo Clinic by J. A. Bargen and F. W. Rankin.⁴

Hirschsprung's Disease (Megacolon).—Last year we referred to two cases of this disease cured by resection of the lumbar sympathetic ganglia (*see* MEDICAL ANNUAL, 1930, p. 129). Further reports were given at the British Medical Association meeting in Canada in August, 1930.⁵ Royle states that the results were excellent in all cases (number not given). Wade, of Sydney, had striking success in all but one of fourteen cases. Learmouth, of Rochester, Minnesota, described a method of cutting the nerves to the bowel, leaving the vasomotor nerves to the legs intact.

Diverticulitis.—J. P. Lockhart-Mummery⁶ gives pictures of early pulsion diverticula, and argues that diverticulitis is due to faecal matter lodging in them.

E. G. Slesinger⁷ points out that in the early stages a diagnosis can often be made when a stout patient past forty, who has always been costive, complains of pain and tenderness in the left iliac fossa, with, it may be, a little rise of temperature. A barium enema shows the diverticulum. Rest in bed, a **Diet** free from food residues, injections of **Liquid Paraffin** retained overnight, and **Atropine** to control spasm, will often relieve. Resection must not be attempted in the presence of peritoneal infection; it finds its proper place in the obstructive type of case, and a three-stage **Mickulicz Operation** is safest. In cases of peritonitis or abscess formation, **Drainage** and a **Colostomy** are the proper treatment. Vesicocolic fistula calls for colostomy, followed later by closure of the diverticulum or resection; it is often not possible to close the colostomy. E. I. Spriggs⁸ adds to the above treatment a fresh culture

of **B. acidophilus in Sterile Milk**. The trouble can usually be controlled if it has not passed the diverticulosis stage.

According to W. H. Rowden,⁹ the skiagrams to show the condition must be taken in the right and left oblique positions as well as in decubitus. The earliest sign is alteration of the haustration, the indentations becoming alternate instead of opposite, and later irregular.

X. Delore,¹⁰ who includes the condition with others under the term 'sigmoiditis,' advises as follows with regard to treatment of the various types of the disease: *Acute perforative cases*—drain, and make an artificial anus; *abscess cases*—first open and drain, later resect with the help of a temporary colostomy; *chronic cases*—resect with a temporary colostomy.

REFERENCES.—¹*Amer. Jour. Surg.* 1929, Aug., 259; ²*Practitioner*, 1929, Sept., 180; ³*Surg. Gynecol. and Obst.* 1930, May, 903; ⁴*Ann. of Surg.* 1930, April, 583; ⁵*Brit. Med. Jour.* 1930, ii, 522; ⁶*Lancet*, 1930, i, 231; ⁷*Ibid.* 1325; ⁸*Ibid.* 1929, ii, 383; ⁹*Brit. Med. Jour.* 1930, i, 381; ¹⁰*Rev. de Chir.* 1929, No. 9, 597.

CONGENITAL HEART DISEASE. (*See* HEART DISEASE, CONGENITAL.)

CONGENITAL STENOSIS OF PYLORUS. (*See* PYLORUS, CONGENITAL STENOSIS OF.)

CONJUNCTIVA, DISEASES OF. W. S. Duke-Elder, M.D., F.R.C.S.

Argyrosis of the Conjunctiva.—Argyrosis of the conjunctiva is a not uncommon condition which usually follows prolonged medication of the conjunctiva with silver compounds. The condition is due to the deposit of silver albuminate in the subepithelial tissues, and as a rule causes no evil effects apart from the objectionable colouring. In a few reported instances the colouring has spread to the cornea, in which case it interferes with vision. Hua¹ reported such a case during the past year (which incidentally developed a glaucoma that this author considered secondary to the deposition of silver), and the reviewer encountered a very severe case in which the deeper layers of the cornea and Descemet's membrane were heavily pigmented. Hitherto the colouring has been looked upon as permanent; but M. F. Weymann,² of Los Angeles, reports success in its removal by a new method. A sterile solution of 12 per cent **Sodium Thiosulphate** is mixed with two parts of a 2 per cent solution of **Potassium Ferriocyanide** and injected subconjunctivally with a fine platinum needle after anaesthetization with cocaine. The injection should be as superficial as possible, and the point of the needle should be moved to as many different areas as possible while the fluid is being injected; thereafter the bleb should be massaged thoroughly through the closed lids. The process is repeated on subsequent days until the entire pigmented area has been dealt with. The reviewer tried this treatment on the case mentioned above, but with little success; it must be admitted, however, that the case was an unusually severe one in which a failure should not be unduly stressed: further reports of the method will be awaited with interest.

Artificial Silk Conjunctivitis.—With the rise of the artificial silk industry, a new occupational disease has come to light which appears to be most prevalent in France. The clinical appearances have been extensively studied by E. Klein³ and Colrat.⁴ The complaint comes on suddenly as a sharp pain in the eye accompanied by a severe spasm of the lids, followed by profuse lacerimation; so severe is the spasm of the lids, and so abundant the flow of tears, that examination is rarely possible except after several applications of cocaine. The ocular conjunctiva corresponding to the palpebral aperture is very red, and punctiform hæmorrhages are sometimes present. The cornea is grey and its superficial layers are swollen; when examination by the

slit-lamp is possible, localized elevations of the epithelium are visible, "about the size of the head of a pin". The spots of raised epithelium subsequently become flattened, and numerous very small superficial erosions result; these sometimes coalesce, leading to a large loss of the surface epithelium. This stage is reached rapidly; Klein has found it present in patients seen three to four hours after the onset. In other cases, in which the initial lesion is apparently more severe, it probably constitutes the first stage. Recovery is usually rapid and complete. No involvement of the iris or structures of the inner eye has been seen. The application of a pad and bandage and the instillation of **Atropine**, and if necessary a **Cocaine Ointment**, are all that is requisite in treatment. Recurrent attacks, however, are not uncommon.

After careful investigation in the factory and some experiments on rabbits with the chemicals employed, Klein concludes that it is probable that sulphuric acid and acid sulphate of sodium are the active agents in the causation of the disease. Apparently the noxious agents reach the eye chiefly in two ways: (1) By fine drops of the solutions which are scattered by the vibrations of the strands of silk from the machinery; and (2) By contact of the worker's fingers with his eyes.

Epidemic Conjunctivitis ('Pink Eye').—Epidemic conjunctivitis, occurring particularly in schools, appears to be becoming a more common complaint, or at any rate it seems to be attracting more attention than hitherto. The disease itself is not a serious one, but occurring in epidemics in a community, and recurring persistently in affected individuals after it has appeared to settle down, it involves considerable discomfort and necessitates much waste of time and no small inconvenience owing to the advisability of prolonged isolation. The first essential in dealing with all such cases is the taking of a swab from the lower fornix of the conjunctival sac and establishing the identity of the organism involved. Usually the Koch-Weeks bacillus is in question, but the Morax-Axenfeld bacillus, the staphylococcus, the streptococcus, and even the pneumococcus may be found. The treatment, apart from effective isolation, is purely local, and the drug which is to be relied upon can profitably be varied according to the organism—for Koch-Weeks bacillus, **Silver**; for the Morax-Axenfeld, **Zinc**; for the staphylococcus, **Mercury Oxycyanide**; for the streptococcus or pneumococcus, **Mercury Perchloride**, and so on.

Spring Catarrh.—The unsatisfactory behaviour of this disease to treatment is only too well known. S. Tontscheff,⁵ however, reports extremely good results with the use of a new method in which he employs **Lactic Acid**. In a series of 19 patients a 'perfect cure' was obtained in 12—an extremely high percentage in this recalcitrant disease. The technique which he uses is as follows: The conjunctival sac is anaesthetized with a 5 per cent solution of cocaine and epinephrin. The upper lid is everted, a horn plate is inserted below it to protect the eye, and a 10 per cent solution of lactic acid is applied by means of a probe tipped with cotton-wool. After one or two minutes the surface of the conjunctiva is neutralized with saline or mercury oxycyanide. The same process is then repeated on the lower lid and on the conjunctiva bulbi, great care being taken to protect the cornea, since the application of the acid here gives rise to an opacity. If there are gross proliferations, these should first be curetted if they are on the conjunctiva of the lids, and if they are on the bulbar conjunctiva they should be excised. The application of the lactic acid may require to be repeated in some instances, and should always be repeated if a curetting or excision of proliferations has been necessary. Solutions up to 40 per cent of acid may be used; it is stated that these cause pain equivalent to that experienced after painting with 2 per cent silver nitrate. After treatment, no bandage is required, and the itching of the lids

and the discharge cease in about three days. Discoloration of the conjunctiva does not follow, and in one case where a drop of the concentrated solution of the acid accidentally fell upon the cornea, the opacity which resulted disappeared after a short time.

Similar good reports are coming to hand of the treatment of spring catarrh by **Radium**. Cases are being successfully treated by this method at the Radium Institute of London, and similar experiences are reported from America. I. W. Riggins⁶ writes enthusiastically about the subject: he employs a low dosage of 10 to 25 mgrm. to each lid for ten to fifteen minutes; with these doses one to three treatments usually suffice (it is claimed) to replace the hypertrophic follicles by soft, atrophied, flexible scar tissue. R. C. Moore,⁷ of Philadelphia, writes in a similar vein; but D. Quick,⁸ of New York, points out that, while radium may undoubtedly be of great value in the treatment of this disease, its use may be followed by serious consequences. He considers that an active deposit of radium emanation collected on lead foil offers the best means of application, and suggests 300 millicurie minutes for each eye as a safe dose under practically all circumstances. With this treatment in a group of 82 cases this author reports excellent results in 40, improvement but not complete cure in 32, and failure in the remaining 10. One of the first essentials is that any complicating secondary infection should first be cleared up before radium treatment is begun; if this precaution is neglected, a violent immediate reaction may occur. Some of the unpleasant end-results to be feared from injudicious treatment are an excessive degree of fibrosis resulting in scarring and thickening of the lids, a loss of eyelashes, and the development of a chronic conjunctivitis. Further, if the eyeball is not protected adequately, there is a real danger of the development of a radiational cataract. Quick reports cases of this complication, and a dozen or so papers have appeared in the German literature during the last few years recording the development of radiational cataract from the injudicious use of radium or X rays for various eye diseases. The method, therefore, should be used with care, in small doses, and over a comparatively short space of time; indeed, it is probable that, attended as it is with some risks, it is well to resort to it only after the failure of the more usual procedures. Used with care, however, it promises more hope of success in recalcitrant cases than any other of the innumerable therapeutic methods which have been advocated from time to time.

Trachoma.—The perennial question of trachoma has claimed an enormous amount of attention during the past year. This is seen nowhere more clearly than in the *Proceedings* of the Thirteenth International Congress at Amsterdam, where an extremely valuable and exhaustive mass of statistical material was collected dealing with the incidence of trachoma over the entire world, together with a summary of the methods adopted by various nations to minimize and circumscribe the ravages of this disease.

ETIOLOGY.—With regard to the etiology of trachoma, little that is fundamental has emerged from the work of the past year. It will be remembered that in 1928 Noguchi brought forward a claim to have isolated the causal organism. From the study of the flora of the lids of American Indians in New Mexico he isolated a peculiar Gram-negative motile bacillus (the *Bacterium granulosis*) which was apparently able to produce a persistent granular conjunctivitis on inoculation into monkeys. Noguchi claimed that the histological characteristics of the experimentally produced conjunctival lesions in monkeys corresponded closely with the characteristic follicles and scar-tissue formation found in human trachoma. The infection, moreover, could be transferred directly by the inoculation of cultures from animal to animal in lower monkeys and the chimpanzee. More recent reports from the Rockefeller Institute of

New York indicate that agglutination tests with the blood serum of trachomatous patients had given encouraging results. This work of Noguchi has inspired a considerable amount of research. H. Stéponowa and N. Azarowa⁹ and W. C. Finnoff and P. Thygeson¹⁰ repeated some of his work and considered that they had confirmed his findings. R. P. Wilson,¹¹ of Cairo, on the other hand, obtained a small Gram-negative bacillus closely resembling the organism described by Noguchi, but in his experiments with monkeys he obtained on inoculation a picture of follicular conjunctivitis similar to that occurring naturally in these animals and not characteristic of trachoma, nor one which would have suggested to the author the diagnosis of trachoma if it occurred in human eyes. It is to be remembered that the trachoma of American Indians differs considerably in histological appearances from that met with in Great Britain, on the Continent, and in Egypt: the follicles in the former type consist almost entirely of epithelioid cells surrounded by a comparatively small ring of leucocytes, while in the latter type they are made up almost entirely of lymphocytes and plasma cells, although one or two epithelioid cells may be present in old follicles.

K. Lindner,¹² of Vienna, went to America to study Noguchi's work at first hand, and concluded that, although the Indians did suffer from trachoma, the lesions observed in monkeys were a simple follicular conjunctivitis. V. Morax¹³ also investigated the question and completely failed to find any organism similar to the *B. granulosis* of Noguchi; moreover, on obtaining samples of this bacillus from America, he failed to excite a pathological reaction on the inoculation of four persons with the cultures. It appears, therefore, that the work of the past year has thrown such grave doubts upon the conclusions of Noguchi that his results can only be looked upon with the greatest reserve.

TREATMENT.—With regard to the treatment, several new methods have received extensive trial during the past year. **Chaulmoogra Oil**, which is painted over, or (better) rubbed into the conjunctiva energetically by means of a glass rod, the process being repeated every three or four days, is regarded by most writers as giving variable results. Wilson,¹¹ of Cairo, has treated an extensively controlled series of cases with this drug, and finds that its effects are determined in individual cases by personal factors of an obscure nature: in some the drug could not be tolerated, while in others a definite improvement was obtained after other drugs had previously failed. Rollet and Chams¹⁴ also report favourable results—in some cases 'truly marvellous'. J. G. Samkowsky,¹⁵ on the other hand, believes that any results obtained depend merely upon the intensity of the application, and claims that the drug is not specific for the disease and possesses no advantage over other methods of treatment. A. Gala¹⁶ came to a similar conclusion, and after prolonged treatment over a series of cases obtained comparable results by massage with **Olive Oil**. Chaulmoogra oil cannot therefore be regarded as a specific remedy for the disease, and on the whole it appears to possess no advantages over older methods. The most that can be said for it is that it is inexpensive, easily applied, and (usually) entails a relatively small amount of discomfort.

Treatment by **Gold Salts** has been given an extensive trial by Wilson, of Cairo, with relatively good results. He recommends a compound called '**Triphal**', the sodium salt of auro-thio-benzimid-azocarbonic acid, which is injected subconjunctivally every four or five days. He concludes that treatment by this method is frequently more efficient than by the older methods, and produces a clearer cornea as an end-result. It labours under the disadvantage, however, of being very costly, and the reaction which is produced is very severe and may be exceedingly distressing to the patient. Several other drugs have been experimented with, but on the whole one can conclude

this review by saying that no specific agent has emerged, and that treatment as heretofore by painting with **Copper** and **Silver** is as satisfactory as any.

Physical methods of treatment have also had their share of attention, and on the whole with little success—**Carbon-dioxide Snow** by Wilson, who reports results inferior to those obtained with copper, and **Diathermy** by A. Monbrun.¹⁷ The latter author claims very satisfactory results. He destroys the infected area of conjunctiva by coagulation necrosis, making use of three methods according to the depth of coagulation desired. The first is the classical method of diathermy with two electrodes, modified only by the fact that the indifferent electrode does not rest directly on the skin, but is separated from it by the clothes, which form the dielectric of a condenser. This method permits an extensive coagulation of tissue and can be utilized for destroying the more exuberant granulations of the palpebral conjunctiva. The second method involves a single electrode only, which is kept in contact with the tissues and has merely a superficial action. This is indicated for use in peritomies and for destroying discrete conjunctival granulations, pannus, and hair follicles. The third method is similar to the second except that the electrode is held one or two millimetres from the surface to be coagulated, so that a spark is allowed to jump across, producing a minimal coagulation. This gives the maximum degree of security in treating a pannus, and is convenient also for destroying very fine granulations. The author claims that this method is rapid and bloodless, and allows the patient to return to his work immediately without requiring further dressings. The end-results are also said to be satisfactory because of the extreme flexibility and suppleness of the resultant scars, which do not appear to be followed by the secondary contractures which are so frequently met with after prolonged treatment by caustics. Raftain¹⁸ reports similarly satisfactory results, and considers that the method of choice in the treatment of the lids is monopolar fulguration. Further reports of this method of treatment will be interesting; but the dangers of diathermy as applied to the eye by unskilled hands must always be remembered.

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CONSTIPATION.

Robert Hutchison, M.D., F.R.C.P.

DIAGNOSIS.—Geoffrey Evans¹ points out that one cannot rely on a patient's own diagnosis of constipation. A careful history and review of the symptoms may lead to a provisional diagnosis, but the diagnosis can only be established by clinical examination. The first essential is to establish the fact of constipation as the primary disorder, and assuming that this is done by the exclusion of disease elsewhere in the body, and by the exclusion of demonstrable organic disease in the digestive tract itself, the accurate diagnosis of constipation on an anatomical and physiological basis is approached.

On an anatomical basis constipation is recognized as occurring in two forms. In the first, known as colon constipation, there is an undue delay in the passage of food residues through the colon. In the second, which is known as dyschezia, there is a failure in the mechanism of defecation. Dyschezia may be further distinguished as due on the one hand to a failure in the function of the rectum to empty, and on the other hand to a failure in the function of the pelvic colon to empty, in defaecation.

On a physiological basis colon constipation is divided into three forms: (1) A general undue delay in the passage of food residues through the colon, which may be termed sluggish colon; (2) An over-irritable or spastic state of the colon, which is termed spastic constipation; (3) An atonic condition of the colon, which is rare, and which is termed atonic constipation.

These several varieties of constipation can sometimes be diagnosed on the clinical history. Thus, a patient suffering from rectal dyschezia will complain of a sense of fullness in the rectum, of a sensation of being unable to empty the rectum completely, of piles, pruritus ani, or other symptoms of rectal congestion. Sigmoid dyschezia may be suggested by discomfort in the left iliac fossa, due to stasis and congestion in the iliac colon, discomfort and a sense of distension immediately above the pubes, or in some cases to an alteration in the action of the bowels, the patient noticing that in defecation there is a single action which is due to the evacuation of the rectum, but that there is no closely following action which results from a complete emptying of the pelvic and iliac colon. In both these cases the stools tend to be hard and passed with difficulty.

Spastic constipation is one of the most obstinate forms of the complaint. It is associated with nervous exhaustion; it is accompanied by abdominal discomfort, which is chiefly felt on the right of the abdomen, and which frequently amounts to actual pain, making the differential diagnosis from chronic appendicitis and cholecystitis a matter of considerable difficulty. Those who suffer from this complaint frequently experience a feeling that food residues do not pass farther than the left hypochondrium, or at any rate never reach the rectum. They have generally acquired the habit of taking laxatives regularly every night at bedtime, and, having tried paraffin oil, agar preparations, and senna pods without success, they have come to rely on phenolphthalein, cascara, or vegetable laxative. On account of increased tone in the rectum and sphincter ani, their stools, when formed, are small and round like a lead pencil, or flat and narrow, sometimes described by the patient as like a tape; generally, as a result of taking laxatives, their stools are loose.

Physical Examination.—Both with a view to establishing the fact of constipation, and with a view to the accurate diagnosis of its variety on an anatomical and physiological basis, the patient who complains of obstinate constipation is advised to take a low-residue diet, one or two drachms of paraffin oil every night at bedtime, to stop all laxatives, and to report again at the end of seventy-two or ninety-six hours. At the same time he is instructed to make an effort to empty his bowels three-quarters of an hour after beginning breakfast, at some time between 6 and 9 o'clock at night, and at any time in the day that he feels the call to go to stool. The low-residue diet is prescribed with the object of preventing abdominal distension, in case the patient should be suffering from spastic constipation. The paraffin oil is to prevent the accumulation of very hard fæces in the rectum and pelvic colon, in case the condition should be one of dyschezia. Laxatives are stopped to allow of the diagnosis of the fact of constipation, and of its variety when present. The bowels having been emptied by laxatives, it naturally takes twenty-four hours for a normal food residue to collect, and another twenty-

four hours before this food residue is an efficient stimulus for evacuation; indeed, owing to the excessive stimulus to which the bowel has become accustomed by the habit of taking laxatives regularly, it may be a further twenty-four hours before a normal stimulus is effective in provoking peristalsis. The instruction to make an effort to empty the bowels three-quarters of an hour after beginning breakfast is given with the object of allowing the gastrocolic reflex time to act; and in case, as a result of some conditioned reflex, it should have become a habit of the bowels to respond to a gastrocolic reflex at a later time in the day, the patient is advised to make the additional effort between 6 and 9 o'clock at night as a regular habit, and at any hour of the day if he feels the least inclination. At the same time he is advised to get up early enough in the morning to have plenty of time to wash and dress before breakfast, time to enjoy his breakfast, and time for defaecation before starting the day's work; he is also advised not to strain at stool, the gastrocolic reflex and defaecation reflex being relied on for normal evacuation.

Having been given these instructions the patient reports again at the end of seventy-two or ninety-six hours, and it may then be possible to determine the fact of constipation, and, if constipation is present, its variety, by clinical examination. Rectal dyschezia will be diagnosed by finding the rectum full of fæces; sigmoid dyschezia may be diagnosed by the same means, though in some cases, where the pelvic colon is out of reach of the examining finger, the accumulation of fæces in it may be a matter of inference rather than one of demonstrable fact. In both kinds of dyschezia there is frequently a fullness, a hardness, or tenderness of the iliac colon. When the condition is one of sluggish or atonic colon the whole abdomen has a doughy feel, or the colon may be distinctly palpated as a large, sometimes rather tender, firm, or doughy mass, occupying the position of the ascending, transverse, and descending colon. In a typical case of spastic constipation the rectum and sigmoid are empty, there may be spasms of the sphincter ani, and so much contraction of the rectum that it fits the finger like a glove; the iliac colon may be felt like a cord tightly contracted, in contrast to the cæcum and ascending colon, which are full, firm, and tender, suggesting chronic appendicitis, the tenderness, however, being more diffuse. When there is tenderness of the hepatic flexure the differential diagnosis is from disease of the gall-bladder and right kidney, and in some cases the reflex spasm of the pylorus and hyperchlorhydria suggest the diagnosis of peptic ulcer.

Other points in the clinical examination of the case, such as the general condition of the patient, his physical form, and the state of his nervous system, assist in the diagnosis; but the differential diagnosis of the varieties of constipation is one of considerable difficulty, and can only be made in some cases by X-ray examination.

TREATMENT.—The first object of treatment is to obtain a regular action of the bowels with the passage of a formed stool. Just as mental depression and emotional distress are responsible for constipation, and just as fear and fright may cause diarrhoea, so constipation is itself responsible for a sense of depression and fatigue, and the constant passage of loose stools over a period of years is the cause of nervous exhaustion, and its cardinal symptom, fear. The second object of treatment is to secure a regular and complete evacuation of the bowels by the regulation of habits of life and food. The importance of habits in allowing an opportunity for the various reflex mechanisms concerned in bowel activity to have an opportunity for their action has already been alluded to. The need for caution in advising anyone to change his dietetic habit should be borne in mind; at the same time it is obvious that rectal dyschezia requires a full-residue diet and a soft stool to assist complete

evacuation of the rectum: while an irritated condition of the colon, such as is present in spastic constipation, must be given rest by the prescription of a low-residue diet, which will save the tired and irritated bowel from unnecessary stimulus. The third object of treatment is to find a drug, where drug treatment is necessary, which will promote the passage of a formed stool without pain or discomfort, and one which can be used without variation, if necessary for years on end, in minimal but adequate dosage. If the laxative employed requires changing from time to time, it is evidence that it is unsuitable for its purpose. Remembering always that the movements of the colon are considerably more sluggish during the night than during the day, it is important that it should not be unduly stimulated by an evening laxative. Excessive colon activity, due to taking laxatives at night, is a common cause of insomnia, and there can be little doubt that almost as much disease and distress of a low-grade and chronic type is caused by the habitual use of laxatives as results from the abuse of alcohol and other stimulants.

In dealing with disorders of the bowel, whether of functional or organic nature, the result of bowel activity must at least be seen, if not examined in a more detailed manner. No man would venture an opinion on the condition of the kidneys without examining the urine, and no man can give a final opinion on the condition of the bowels without seeing the stools. Apart from the completeness of digestion of food residues, which can be largely judged by the inspection of the stools, and apart from the presence of mucus, pus, and blood, which may be an indication of organic disease, the size and shape of the stool provide an indication of the state of tone of the rectum and anal sphincters; the bulk of the stool gives some idea of the patient's diet and rate of passage of food residues through the bowel, and the fact of the last part of the stool being soft or semi-solid is a good criterion that evacuation has been complete.

REFERENCE.—*Brit. Med. Jour.* 1929, ii, 1044.

CONTRACEPTION. (See PREGNANCY AND ITS DISORDERS.)

CORNEA, DISEASES OF.

W. S. Duke-Elder, M.D., F.R.C.S.

Corneal Grafts.—For many years research and experiments, somewhat sporadic in their nature, have been applied to the practicability of corneal grafts. If a successful technique could be evolved which would promise a reasonable prospect of success in that a corneal graft would 'take', and having taken remain transparent, an advance of considerable importance would have been accomplished, for an extensive ulceration or inflammation of the cornea too frequently leaves behind it a dense scar that renders the eye functionally useless. Experimental work with this end in view has been conducted by C. W. Rucker¹ and, with painstaking perseverance, by Tudor Thomas.² Although the researches of the latter have not yet progressed to the stage of clinical application, they are full of interest in that they seem to promise satisfactory results. His experiments, which were conducted upon rabbits, have shown that grafts involving the entire thickness of the cornea can be transplanted with a fair degree of success. The probability of a good result depends upon the details of the technique; thus the graft should be very slightly smaller than the gap to be filled (and not larger as in other tissues), since the corneal tissue tends to swell; it should be cut with a shelving margin; and it should be affixed by sutures, not piercing the substance of the graft (a procedure which almost invariably results in opacification), but anchored to the cornea at the sides of the graft and passing over it crosswise, retaining it in its place by pressure upon the shelving margin. At the time

of writing no results have been recorded upon the human subject, and any reasoning must be transposed from experiments upon animals to the clinical application of the technique only with the greatest caution; moreover, a diseased and degenerated cornea (for such would be the condition of any cornea upon which grafting would be considered clinically) offers problems more difficult than, and of a somewhat different nature from, the healthy cornea of a rabbit. Nevertheless the importance of the question makes the results of interest, and it is possible that their clinical application may not be long delayed.

One of the ablest exponents of the technique of corneal grafting is A. Elschmig,³ of Prague, who has recently recorded his experience of 174 cases. The method which he employs is briefly as follows. A very careful pre-operative toilet of the eye is made, consisting of a general physical examination of the patient, a bacteriological examination of the conjunctival sac, and a clinical examination of the lacrimal passages. If everything is found in a favourable condition, the conjunctiva is irrigated daily for one week with a 1-5000 **Mercury Oxycyanide** solution. The operation itself is preceded by anaesthesia which consists of the instillation of 2 per cent cocaine over a period of twenty minutes, with which is included a 1 per cent solution of **Physostigmine Salicylate** in order that the contracted iris may protect the lens during the trephining. The orbicularis is paralysed with procaine and epinephrin, and finally a retrobulbar injection of the same solution is made from a point on the inferolateral margin of the orbit through the lower lid. Stay sutures to control the eye are then inserted round the superior rectus or the inferior and lateral recti. A black silk suture with a needle at each end is now inserted at the upper margin of the cornea 1.5 mm. from the limbus, and each end of this is inserted in a similar manner below the lower margin of the cornea in such a fashion that when tension is put on the silk the two strands will pass parallel to each other over the site of the transplant. These silk sutures are now displaced to either side of the cornea, and the lids are temporarily closed. The enucleation of the eye from which the transplant is to be taken is now done with the utmost care, so that the corneal epithelium is protected from any trauma. While an assistant holds the enucleated eye with sterile gauze between three fingers, the surgeon places two of his fingers on the equator of the eyeball and applies pressure so that the cornea is under sufficient tension. A 4- or 4.5-mm. von Hippel trephine is then placed vertically over the centre of the cornea and a disc of corneal tissue excised; this is lifted up with a spatula and placed on a sterile piece of gauze without being touched by forceps. The same trephine with which the transplant was obtained is now immersed in boiling water and placed vertically over the future site of the transplant, being adjusted to a height of 1 to 1.2 mm. less than that for the trephining of the transplant, in order to prevent too rapid penetration of the cornea, with the danger of injuring the iris or the lens. If the cornea is incompletely penetrated, the trephine may be slightly lengthened or the excision may be carefully completed with a small knife. The transplant is then placed in position with the spatula, the black silk sutures are tied over it, and the eye is covered up. The patient remains in bed in the recumbent position for two days; thereafter the silk suture is removed and the eye is kept bandaged for a fortnight. During the third week the eye is uncovered several times a day for from half an hour to two hours at a time, and is not wholly uncovered until the end of the third week, and then only if the transplanted disc is not bulging. If it is found to be bulging, a pressure bandage is applied, and if this does not bring about a reduction, a paracentesis (which may be repeated) is done.

Elschnig considers that the operation is almost hopeless in cases of total leukoma, especially after chemical or open flame burns, and should never be attempted when the iris is adherent to the cornea. After the inflammatory condition which has caused the corneal opacity has died down, massage of the cornea and the application of **Dionin, Potassium Iodide, and Yellow Oxide of Mercury Ointment** should be made for six or nine months in order to clear up the cornea as much as possible, and at the same time to reduce the inflammatory hyperæmia in the leukoma to a minimum. The operation, moreover, should never be done except when the perception and projection of light are extremely good.

As a rule a slight cloudiness of the implant occurs between the second and sixth day, but a week after the operation this usually clears up and entails no bad prognosis. It is only in the most unfavourable cases that the cloudiness increases, in which case the implant may become completely opaque in three or four weeks. A permanent cloudiness of this nature usually begins with an increase in the number of blood-vessels, so that the implant is slowly changed into a non-transparent scar. Even in the most favourable cases a thickly scarred ring is formed, during the first weeks after the transplantation, along the border of the implant and around the entire circumference. It is curious that the remainder of the cornea often clears up considerably, especially in cases of interstitial keratitis, the effect being due presumably to the biological irritation of the graft leading to a regenerative clearing up of the periphery of the cornea: this may occur even though the transplant itself should become completely opaque. If the transplant should become opaque, and in the event of the periphery of the cornea not having cleared up to such an extent that an iridectomy could sufficiently improve the vision, another transplantation may be attempted after the lapse of three months. This can be repeated several times, but only in a few cases can a second or third keratoplasty give a successful result.

With this technique Elschnig has operated on 35 cases in order to replace an extensive adherence of the iris to the cornea, and in the great majority the result was disappointing. In 139 patients with an opaque cornea who were operated on to improve vision the results were very much better. Out of 113 cases of leukoma after flame or chemical burns, or after ulceration with the entire destruction of the cornea, the transplanted disc remained clear in 15, and partially transparent in 31. All of these had improvement in vision, the greatest advance being from hand movements to 6/6. In 45 cases the implant became totally opaque, and in 22 cases (the majority with aphakia, which is a contra-indication for undertaking the operation) the implant did not remain in place. The most favourable results were obtained in 26 cases which showed thick scars after interstitial keratitis. Among these, in one the disc was lost, in 6 the implant became opaque, in 2 vision was improved with a partially transparent implant, and in the remaining 17 a very clear cornea with marked improvement of vision resulted. It appears, therefore, that keratoplasty in its present stage of evolution can be successful in 22 per cent of all cases, and in 72 per cent of cases of interstitial keratitis. These results, to say the least of it, are extremely satisfactory when one remembers that in every case the eye was useless as an organ of vision before operative interference was undertaken.

Corneal Tattooing.—Considerable interest has gathered of late around the question of tattooing the cornea. The old method of tattooing with Indian ink was not particularly successful; it frequently was not permanent as the ink particles tended to migrate, and the application of the ink was occasionally followed by a violent reaction. In 1925 P. Knapp⁴ introduced a technique of

tattooing with a preparation of gold, and since then several methods have been suggested, some of which have been attended by considerable success. The most widely used of these make use of solutions of gold and platinum chloride. The technique of tattooing with **Gold Chloride** is as follows: The solution used is a 2 per cent gold chloride solution neutralized with sodium bicarbonate so that it is just faintly acid to litmus paper: very dense and vascular leukomas may require a 3 or 5 per cent solution. The cornea is anesthetized with cocaine or phenacaine, without epinephrin. The area to be stained is outlined carefully with a large trephine or fine knife, and the epithelium is thoroughly and evenly scraped off, hæmorrhage being stopped without the use of epinephrin. A cotton carrier, large enough to cover the part to be stained, is dipped in the faintly acid gold chloride 2 per cent solution, pressed out so as not to be dripping wet, and held against the denuded area. A fresh applicator is used every minute, and after three minutes there will be a brown stain which after five minutes should be almost black. The reducing agent, **Epinephrin**, or the more vigorous fresh 2 per cent **Tannic Acid**, is then dropped on the surface of the cornea for from one to two minutes; the eye is flushed with physiological solution of sodium chloride, and is then bandaged. Epinephrin must not be used during the anesthetizing, as it will reduce the gold chloride as soon as it is applied, and before it can penetrate into the corneal stroma. To achieve a grey instead of a black effect the cornea may be stippled, the result being a large number of fine black spots which give a grey appearance against a light background.

Reports of several hundred successful cases employing this method are now to hand from about a score of different investigators, and only three complications were noted: two in which the operation was performed upon normal corneæ to hide a cataract developed hypopyon ulcers, which in both cases cleared up; and in the third case an old iridocyclitis became active, but this also resolved, although the reaction abolished the effect of the tattooing. The cosmetic results in most cases were gratifying, although a completely black stain is impossible to obtain with the use of gold.

The technique with **Platinum Chloride**, using **Hydrazine Hydrate** as a reducing agent, is similar. No neutralization of the platinum solution is needed. On the other hand, the hydrazine hydrate must be fresh and never more than a week or ten days old. The concentrated platinum chloride solution keeps well, and from it the 2 per cent solution can be made up shortly before it is used. The field is prepared (anesthetizing and scraping off the epithelium) as for gold, but the cornea is washed with sterile distilled water instead of salt solution. Two per cent platinum chloride is then applied for two minutes on an applicator as for the gold chloride. It is reduced with hydrazine hydrate for twenty-five seconds and then washed immediately with sterile water, by which time the colour should appear promptly. Two minutes later the eye is washed well with a physiological solution of sodium chloride, and then bandaged. The hydrazine hydrate is best applied from a dropper, a small drop being allowed to run on to the treated area and to rest there until washed off, thus preventing any unnecessary irritation of the remainder of the cornea. The results are even better than with gold, an absolutely dense black stain with a metallic lustre being obtained. Too short a time has elapsed to indicate the permanence of the colour with platinum, but so far as can be judged at present the method appears to be the better of the two; either is much simpler and safer than the older methods. S. Holth⁵ uses a variety of solutions: as well as with platinum chloride and hydrazine hydrate he obtains a black colour with a 5 per cent solution of fresh **Iron Sulphate** and a fresh 5 per cent solution of **Tannin**. He also suggests water-soluble **Silver Salts**

and **Hydrazine Hydrate** to imitate a brown iris, **Lamp Black** and **Cobalt Tannate** to simulate a blue iris, while if a greenish tint is desired some **Burnt Sienna** is added.

G. Bietti, jr.,⁶ has studied histologically the rationale of the process of tattooing with gold, platinum, and silver. He found that the regeneration of the corneal epithelium after tattooing with platinum chloride generally took place within four days, and with the other metals within from five to six days. Gold chloride penetrates faster and deeper than platinum chloride. The impregnation differs in different cases, but it appears the metal is deposited in the corneal cells and between the lamellae, from which it migrates into the regenerated epithelium. The chief cause of decoloration is the new formation of connective tissue in necrotic areas which frequently appear in leukomas on account of their poor tissue resistance and their great tendency to the formation of connective tissue.

In addition to those already referred to, papers by the following, which have appeared within the last year's survey, may be consulted with advantage: G. Buer,⁷ M. A. Dollfus,⁸ G. Krautbauer,⁹ M. Magnasco,¹⁰ and D. K. Pischel.¹¹

Corneal Ulcers: Treatment by Ultra-violet Light.—Two communications have appeared on the treatment of corneal ulcers by ultra-violet light: one from the physiotherapeutic clinic at Moorfields Hospital by W. S. Duke-Elder,¹² and one by Hollos and Linsz¹³ detailing the results of treatment as practised by Birch-Hirschfeld. In the tissues of the cornea, as occurs elsewhere on the surface of the body, the cells are injured by small intensities of radiation: with great intensities they are destroyed. It is this end, under proper control, which is desired in the treatment of ulcers of the cornea, and the active response which the traumatism of light evokes repairs, and more than repairs, the damage which is done. It is probable that the therapeutic effect of short-waved light when applied to the cornea in inflammatory, ulcerative, and degenerative conditions depends on the following factors. In the first place, pathogenic micro-organisms in the most superficial layers of this tissue will be directly killed. The lethal action of short-waved light upon such organisms is well known, and in a transparent tissue like the cornea this bactericidal power will be much more effective and extend more deeply than in an opaque and highly absorbent tissue like the skin. Where there is much inflammatory reaction and infiltration present in the superficial corneal layers, however, the greater part of the abiotically active rays will be absorbed, and in this case any lethal effect will necessarily be slight and practically restricted to the surface; but in proportion as some degree of transparency remains, bactericidal action will be greater and extend more deeply. In the second place, the superficial cells of the diseased corneal epithelium are killed and cast off with any contained bacteria. Thirdly, the intense vascular reaction at the limbus and the invasion of the cornea by blood-cells and inflammatory oedema will flood the diseased area with bactericidal influences. Fourthly, the stimulation to rapid and healthy regeneration of the exfoliated epithelium is a beneficial factor in any type of ulcer, but one which becomes of first importance in chronic and recurring conditions. Finally, it is probable that the absorption of the products of disintegration of the proteins of the cells will exert a favourable influence over the local immunological mechanism. In the application of the treatment, however, great care must be exercised, and a special apparatus must be employed in order to allow the dose to be graded adequately, and—more important—in order to protect the lens, for, while massive doses of light can produce a cataract, smaller doses can undoubtedly induce changes in the proteins of this tissue which render their subsequent coagulation more easy.

Corneal ulcers of practically every kind respond well to radiation with ultra-violet light, but inasmuch as the more simple types of ulceration tend to heal up with the usual methods of treatment, it is in the more severe, the chronic, and the recurrent forms that the beneficial effect of treatment can be seen to the best advantage. In the more simple forms healing without any opacity is usually obtained; and the method has been found extremely useful in cases of foreign bodies in which infection has already become evident. With the more severe types of ulceration radiational treatment is the method of choice. In hypopyon ulcers, for example, a greater chance of recovery is offered than can be expected from cauterization, with, at the same time, less permanent damage to the cornea. Chronic ulcers, also, associated with a varying degree of deep keratitis and corneal opacity, and sometimes with iridocyclitis, in which the eye has reached a torpid and sluggish state, and which have progressed over long periods in spite of the usual treatment, may frequently be made to heal over and remain quiet after a course of three, four, or more exposures to light. The deep lesions of corneal acne may also be very favourably influenced. Recurrent ulcers, especially those of the marginal type, respond very favourably, and if the treatment is repeated several times, the new layer of epithelium appears frequently to be able to withstand the liability to break down on future occasions. As a general rule the ulcer heals up after the first or second exposure, and in the milder cases heals up leaving a transparent facet; but it is preferable in most of these cases to give a third or fourth exposure, bringing about a mild reaction each time, involving a traumatism and renewal of the epithelium in order to render the possibility of recurrences more remote.

Acute phlyctenular ulcers occurring in children respond so well to general light treatment and efficient dieting and hygiene that it is not worth while, as a rule, to coax a child affected with this disease to submit to keeping its eye open in the beam of the slit-lamp. It is in the chronic cases which have gone on for years, leaving an ulcerated, opaque, and vascularized cornea, and involving continued irritation, frequently with acute exacerbations, that the method has its greatest use. In these cases the eye quiets down and becomes white and comfortable, but the extensive opacities, which are already present with the resulting diminution of vision, remain.

Keratitis Exfoliativa.—Kirby¹⁴ has recently drawn attention to the rare condition of keratitis exfoliativa which may occasionally occur as a complication of treatment with the intravenous injection of arsenical preparations, usually in association with an exfoliative dermatitis. He reports two cases, each of which had a strongly positive Wassermann reaction and was treated with arsphenamine injections. A pronounced exfoliative dermatitis developed involving all parts of the integument, the subcutaneous tissues being greatly swollen and desquamation profuse. The eyelids were swollen and could only be opened with difficulty by means of retractors, when a mucopurulent discharge escaped. The conjunctivæ, both palpebral and bulbar, were congested and showed large areas of exfoliation, and the corneæ showed similar large areas denuded of epithelium which stained intensively. Conservative treatment was tried for the first few weeks, with little improvement in the condition, and finally the following technique was adopted which met with a successful result. After anæsthetization, the softened corneal epithelium was completely removed with a curette, and 3.5 per cent **Tincture of Iodine** was applied. Bowman's membrane when intact remained smooth, but when softened or roughened or absent, took on the iodine stain. Thereafter the entire corneal epithelium healed over, except for a small area in one eye of one case, which healed after a repetition of the treatment. Permanent scarring of the cornea, however, may result.

Keratitis Sicca.—A clinical entity, keratitis sicca, has been defined by Duke-Elder¹⁵ wherein a characteristic train of symptoms follows a deficiency of lacrimal secretion. It appears that the mucous secretion of the conjunctiva in certain instances is unable to keep this membrane adequately lubricated, in which case a chronic irritative kerato-conjunctivitis may develop. This is characterized by a continual irritation of the eye, with considerable photophobia and the presence of a viscous, sticky secretion on the lids. Situated in the deeper layers of the corneal epithelium, and more rarely in the superficial part of the substantia propria, are considerable numbers of punctate opacities which may be relatively large and diffuse, or small and discrete. These are more numerous in the lower segment of the cornea and may be associated with the presence of epithelial filaments. Such cases can be assorted into three groups: (1) Those cases in which an absence of lacrimal secretion is present congenitally. (2) Those in which a failure of tears follows some trauma, such as a fracture of the base of the skull, a destruction of the lacrimal gland by disease, or its removal by operative means. It is noteworthy that an excision of the lacrimal gland for the relief of excessive laceration cannot always be undertaken with impunity. (3) A third group of cases occurs spontaneously in women after the period of the climacteric. In these a somewhat similar defect may involve the salivary glands of the mouth and the sweat-glands of the skin, and a periodic swelling of the parotid gland has been noted. The clinical picture is similar, being characterized by a chronic conjunctivitis showing velvety papillae with a tenacious secretion containing epithelial cells, while in the cornea punctate opacities and sometimes filaments are evident, especially in the lower periphery. The symptoms are usually alleviated by the periodic instillation of **Oily Drops**, such as paroline. Weve,¹⁶ of Utrecht, however, has found a considerable improvement after the instillation of **Fibrolysin** into the conjunctival sac once a day. In a case of this nature wherein the lacrimal gland was excised for epiphora, this treatment has been continued for eight years, during which time the patient has comfort as long as the fibrolysin is used, but the symptoms return as soon as the remedy is stopped.

Keratomalacia.—A very considerable advance in our knowledge of keratomalacia has been made by A. Pillat,¹⁷ of China. Hitherto it has been generally held, and has been stated in text-books, that keratomalacia occurs solely in infants and in young children, being exceptionally rare after the tenth year. In his experience in the Far East, however, Pillat finds that keratomalacia frequently does occur in adult life. His cases are interesting in providing a complete picture of the disease, since affected children, which are always debilitated and under-nourished, usually die of general weakness or bronchopneumonia before the typical symptoms develop fully. The disease, which is caused by under-nourishment, and more especially by the absence of vitamin A from the diet, affects the entire integumentary system, with its appendages, the skin-glands, the hair, and the nails. The extensive pigmentation which occurs on the skin and the conjunctiva would seem to indicate that the suprarenal gland is also affected in a way similar to Addison's disease; moreover, the epithelial cells of the respiratory and digestive tracts are usually involved, leading to diarrhoea and bronchopneumonia, which is frequently fatal. So far as the eye is concerned, the condition manifests itself as a xerosis of the bulbar conjunctiva which may culminate in an extreme softening and degeneration of the cornea leading to ulcerative destruction and perforation followed by total blindness. The rods and cones (which are also epithelial elements) may also be affected—a complication which is rendered evident by the development of hemeralopia. The treatment, of course, is essentially **Dietetic**.

Keratoconus and Contact Glasses.—Keratoconus, which is essentially a progressive stretching of the corneal tissues associated with great deterioration of vision which usually first attracts attention in adolescence, has sprung into interest of late owing to attempts to improve the vision by means of contact glasses. The essential features of the disease have been summarized by A. Knapp.¹⁸ It occurs usually in poorly nourished, anæmic patients, who present various signs of a mild thyroid deficiency, such as nervous disturbances, a dry skin, increased sweating, fragile nails, loss of hair and hypertrichosis, a low blood-pressure, and a low basal metabolism. An endocrine origin of the disease seems likely, and has been very insistently stressed by W. Meerhof, A. Meerhof, and J. M. Parija,¹⁹ and by A. Löwenstein.²⁰ The treatment may include three methods of attack: (1) Medical—polyglandular therapy and general tonics; (2) Operative—cauterization with the galvano-cautery, with perforation of the cornea, iridectomy, and tattooing when necessary; (3) Optical—with the contact glass.

The operation recommended by Knapp is as follows: Under atropine mydriasis the apex of the cone is determined by a Placido's disc, and with a round cautery 2 mm. in diameter the corneal apex is burnt down to the deepest layers, final perforation being effected with a fine point-cautery so that a sudden escape of aqueous humour is avoided. Actual perforation is necessary to obtain a proper flattening of the cornea with permanent correction of the deformity. Atropine ointment and a binocular bandage are applied until the anterior chamber is re-formed, which usually takes from ten to fourteen days, whereafter a unioocular bandage is worn constantly for six weeks, to be followed by a pressure bandage worn during the night for the next six weeks. If the anterior chamber is slow in re-forming, the fistula may be covered by a conjunctival flap. In fourteen cases treated in this way, the average visual improvement was from a vision of 2/200 to 10/200 to that of from 20/30 to 20/50. One eye was lost through panophthalmitis.

Treatment by **Contact Glasses**, although suggested by A. E. Fick²¹ in 1887, has only recently received the attention it deserves. L. Heine, who was largely responsible for their introduction into ophthalmology, writes of them with considerable experience. The glass is a small, uniformly curved sphere which fits the eyeball closely, and is inserted under the lids, resting on the sclera beyond the limbus. It can be worn for a considerable length of time without causing irritation or doing the corneal epithelium any ascertainable harm. The glass itself replaces the corneal curvature so that it is eliminated from the dioptric system with any irregularities it may possess; consequently in such a condition as conical cornea, wherein the poorness of the vision is due solely to the shape of the cornea, the visual acuity may be increased from 6/60 to 6/6.

In the ordering of contact glasses, a glass is chosen of curvature such that it adjusts the defective vision in combination with the optical system of the eye. The lacrimal fluid collects between the glass and the cornea, and since the glass, the tears, and the cornea have all practically the same index of refraction, any irregular corneal astigmatism is eliminated: the appliance may therefore be tried in any case of irregular corneal astigmatism. Any residual spherical error which remains can be corrected still further by the addition of lenses in a spectacle frame. It is essential that the glass should fit the sclera well, and for this purpose I. von Csapody²² has suggested a technique for taking a paraffin mould of the eye. Molten paraffin of a melting-point of about fever heat is poured into a glass cylinder which separates the lids and fixates the eyeball, and this is allowed to cool and harden *in situ*. A mould of plaster-of-Paris is then shaped upon the paraffin negative, and the

rim of the contact glass ground accordingly. The appliance is best put in place by the ophthalmic surgeon until the patient becomes accustomed to it, but he soon acquires the necessary technique. The glass is filled with physiological saline and is then inserted underneath the lids with the head bent down: once in place, it is retained by capillarity and the pressure of the lids, and the fluid is replaced by lacrimal secretion. The glasses should be worn only for a few hours at a time at first; some patients do not seem to be able to tolerate them well, most are little inconvenienced by their use during the working hours, but others wear them indefinitely with little or no discomfort. V. S. Popovici²³ reports a case in which great visual improvement was obtained; the patient wore a glass uninterruptedly without ill effects for six months, with one day's interval every six days. A. Deutsch²⁴ finds that if one eye only is corrected, disturbing diplopia may neutralize the good effect of the glass.

The following authors have also written papers which should be studied in this connection: P. A. Jaensch,²⁵ O. Katz,²⁶ and Torok and Redway.²⁷

REFERENCES.—¹*Arch. of Ophthalmol.* 1920, ii, 692; ²*Trans. Ophthalmol. Soc. U.K.* 1930, 1; *Proc. Roy. Soc. Med.* 1930, xxiii, 1437; ³*Arch. of Ophthalmol.* 1930, iv, 165; ⁴*Klin. Monats. f. Augenheilk.* 1920, lxxviii, 41; ⁵*Acta Ophthalmol.* 1920, vi, 354; ⁶*Klin. Monats. f. Augenheilk.* 1920, lxxvii, 741; ⁷*Ann. d'otol.* 1920, lviii, 900; ⁸*Ann. d'Oculist.* 1920, cxxvi, 722; ⁹*Klin. Monats. f. Augenheilk.* 1930, lxxix, 86; ¹⁰*Saggi de Oftal.* 1928, iv, 73; ¹¹*Arch. of Ophthalmol.* 1920, iii, 176; ¹²*Brit. Med. Jour.* 1920, ii, 41; ¹³*Zeits. f. Augenheilk.* 1920, lxxviii, 151; ¹⁴*Arch. of Ophthalmol.* 1920, ii, 661; ¹⁵*Brit. Jour. Ophthalmol.* 1930, xiv, 61, 185; ¹⁶*Nederl. Tijds. v. Geneesk.* 1928, 1, No. 7; ¹⁷*Arch. of Ophthalmol.* 1920, ii, 256, 399; ¹⁸*Ibid.* 655; ¹⁹*Arch. de Oftal.* 1920, iv, 129; ²⁰*Arch. f. Ophthalmol.* 1920, cxxi, 730; ²¹*Munch. med. Woch.* 1930, lxxvii, 495; ²²*Klin. Monats. f. Augenheilk.* 1920, lxxvii, 818; ²³*Clin. med.* 1920, No. 9; ²⁴*Klin. Monats. f. Augenheilk.* lxxvii, 1920, 245; ²⁵*Zentralb. f. d. ges. Ophthalmol.* 1920, xxi, 305; ²⁶*Amer. Jour. Ophthalmol.* 1920, xii, 835; ²⁷*Arch. of Ophthalmol.* 1930, iv, 348.

CORONARY ARTERY DISEASE. (See ANGINA PECTORIS AND CORONARY ARTERY DISEASE.)

CORONERS' CASES AND MEDICO-LEGAL WORK. (See also LEGAL DECISIONS, RECENT.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

Cyanide Poisoning.—H. Williams¹ records cases of acute cyanide poisoning, none of which proved fatal, apparently due to the ingestion of silver polish. Some thirty persons became acutely ill after an hotel dinner. The food was wholesome, but an examination of the powder used for cleaning the silverware showed that it contained over 20 per cent of sodium cyanide. It was ascertained that similar cases had occurred at many hotels where this compound and others containing cyanides were used as a routine. The utensils were usually dipped about once a week in a solution made from this powder and allowed to dry without being rinsed.

The City Coroner held an inquest on the body of a chemical laboratory assistant who accidentally inhaled the fumes of hydrocyanic acid. The deceased was cleaning out the sludge from a tank, which consisted of a mixture of silver nitrate and sodium cyanide. He stirred pure water into the mixture and silver cyanide and sodium nitrate should have been formed, both innocuous. Some bubbles of hydrocyanic acid gas were apparently confined in the sludge and became released. Accidental poisoning with hydrocyanic acid gas has occasionally occurred during the deratization of ships with this fumigant; otherwise such cases of accidental poisoning are of the greatest rarity.

The *Lancet*² reports the death of a farmer from cyanide poisoning. It is said that he was blowing a rat-poison powder down a rat hole in a closed shed by means of a bellows. It is unnecessary and most undesirable that cyanides

should be used for rat poisons when such effective poisons as barium carbonate or red squill are available.

The above cases emphasize the need for the greatest care in handling preparations containing cyanide, owing to its highly lethal nature.

Methyl Chloride Poisoning from Electric Refrigerators.—A. H. Kegel, W. D. McNally, and A. S. Pope³ report a number of cases of accidental poisoning from methyl chloride. This substance is a colourless fluid which boils at 24° C., the vapour having only a faint odour. It is used in domestic and commercial refrigerators, and the danger only arises when apparatus is defective or is being repaired. No substance should be used for refrigerating purposes which has not a marked odour and irritant properties.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, xciv, 627; ²*Lancet*, 1929, ii, 792; ³*Jour. Amer. Med. Assoc.* 1923, xciii, 353.

CRETINISM. (See THYROID GLAND.)

DEAFNESS. (See also AUDITORY IMPERCEPTION, CONGENITAL; EAR, DISEASES OF; OTOSCLEROSIS.) A. J. M. Wright, M.B., F.R.C.S.

Hearing Tests.—The desirability of some method of testing the hearing which will give scientific accuracy is obvious. In the past reliance has been placed on testing with tuning-forks, the watch, the acoumeter, and the spoken voice. While, in the hands of trained observers, these have been proved reasonably efficient in arriving at a diagnosis, scientific accuracy has been impossible. An electrical instrument, the *audiometer*, has now been in use, particularly in the United States, for some years, and a description of the method of its use is given by G. E. Tremble.¹ By means of this instrument the hearing can be tested for tones covering the greater part of the audible scale. The tones produced by an oscillating circuit are conducted to the patient's ear by a telephone receiver. The pitch and intensity of the sound can be varied at will, and when testing, the minimum intensity of any given pitch which can be heard is taken as the standard. A curve of the result is plotted on a special chart. There is no doubt that by the use of this instrument an accurate record of the patient's hearing for tones of different pitch can be rapidly obtained, even by an unskilled observer. The charts give a vivid picture of the type of hearing defect, and it is possible to compare the charts of cases made by different observers. The instrument has perhaps been found most useful in dealing with a large number of cases such as is met with in the examination of school-children.

The variable degree of hearing met with in cases of apparently similar lesions is very noteworthy. A. L. Yates² has made an ingenious suggestion as to one possible explanation for this. He points out that the organ of hearing has developed from a tactile sense organ. Man's power of intellectual hearing has grown in conjunction with an ever-increasing tactile and muscle sense. It seems that in individuals in whom the tactile sense is poorly developed the intellectual hearing power is also deficient, and in such individuals a lesion of the auditory mechanism produces a relatively high degree of defect in hearing.

Localization of Sound.—The localization of sound is a sense of considerable importance, and the exact method by which it operates is as yet uncertain. T. C. Green³ suggests that the localization is due to two factors: (1) The time factor, i.e., the sound reaches one ear before the other; and (2) The intensity factor, i.e., it is heard more loudly in one ear than in the other. He suggests that the time factor is the more important of the two. He found that the majority of patients with middle-ear disease located sound normally. He also found that in individuals with a lesion of the temporal lobe or increased intracranial tension, localization was defective.

Deafness of Focal Infective Origin.—G. W. Mackenzie¹ believes that focal infection is a cause of nerve deafness and a more frequent cause of progressive deafness than all other causes combined. In many cases the deafness is unilateral, perceptive in type, and accompanied by vertigo and diminished vestibular reactions. In cases of deafness of uncertain etiology he advises a thorough examination of the nose, throat, and mouth. In addition, a blood examination should include cell-counts, a Wassermann reaction, and estimation of blood-sugar. The urine should be examined, especially for organisms or the presence of indican. Proof of the influence of any focal infection is shown by the improvement in hearing on its removal.

Treatment of Chronic Deafness.—At a discussion on this subject at the Royal Society of Medicine, H. Kisch⁵ emphasized the fact that not sufficient attention is at present paid to the prevention of deafness. Deafness due to inflammatory changes in the middle ear and Eustachian tube can be very largely prevented by attention to inflammatory attacks in the acute stages and by teaching that, by attention to associated infection in the nose and throat at the onset of defects in hearing due to catarrhal changes, much may be done. Kisch regards the improvement sometimes noticed with the re-education method as being explained by the fact that a considerable functional element is frequently added to the organic defect.

D. McKenzie⁶ gave his results from the use of **Diathermy**. For the method employed see MEDICAL ANNUAL, 1929, p. 137. Of 46 unselected cases of dry deafness, in 5 the deafness and tinnitus disappeared after from two to six applications. Great improvement was obtained in 5 others; of the remaining 36, 13 showed temporary improvement, and 21 no improvement at all. It was found that cases in which the deafness was of short duration were the more hopeful. The effect on tinnitus is variable; in some cases it is lessened and in others made worse.

G. Catheart⁷ gave the result of further experience with the **Re-education** method of Zund-Burguet. Of 623 cases of chronic deafness of various types treated, 396 showed considerable improvement—a percentage of over 60.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1930, Jan., 71; ²*Proc. Roy. Soc. Med.* (Sect. Otol.) 1929, Sept., 1480; ³*Arch. of Surg.* 1929, xviii, 1825; ⁴*Zentralb. f. Hals-, Nasen- u. Ohrenheilk.* 1929, xiv, 262; ⁵*Jour. Laryngol. and Otol.* 1929, Sept., 618; ⁶*Ibid.* 625; ⁷*Ibid.* 630.

DELIRIUM TREMENS. (See ALCOHOL AND DRUG ADDICTION.)

DEMENTIA PARALYTICA.

Macdonald Critchley, M.D.

Treatment with Sulphur Injections.—K. Schroeder¹ has treated a series of cases of dementia paralytica with a preparation named '**Sulphosin Leo**', consisting in a 1 per cent suspension of sublimed sulphur in sterile olive oil. Deep intramuscular injections are given every three or four days, starting with a dosage of 0.5 to 1 c.c. and increasing each time by 1 c.c. The injections are followed within a few hours by a fever which attains its maximum usually by the twelfth hour. There is an accompanying leucocytosis of from 20,000 to 35,000. A course consists in ten injections. Of 12 patients so treated, 4 were discharged in 'full remission'; 1 in 'good remission'; 1 in 'remission'; and 1 as 'improved'. H. Marcuse and E. Kallmann² obtained a marked improvement in 19 per cent of advanced cases, and a 'fair to marked improvement' in 41 per cent. A. Warstadt,³ W. Pires,⁴ and G. Stieller⁵ also testify to the value of this form of treatment. In this country reports have been made by N. G. Harris⁶ (14 cases); Shilvoek⁷ (9 cases); and Patterson and Switzer⁸ (19 cases). Shilvoek used a preparation of sulphur in olive oil ('**Colsul**') prepared by the Crookes Laboratories. Results in a few patients

have been recorded in the United States (Read⁹). There is but little information as to the effect upon serological reactions. Read states that the blood Wassermann reaction has been reduced in some instances, while the spinal-fluid reactions remained unaltered.

The treatment seems to be of value in cases where malaria cannot be induced or is contra-indicated. The maximum temperatures are usually less high with the sulphur therapy, and there is less deleterious effect on the circulatory system. A grave disadvantage, of which Schroeder makes light, is the large bulk of oil necessary for the final injections, which may produce very severe local reaction.

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DEMENTIA PRÆCOX.

Henry Devine, M.D., F.R.C.P.

ETIOLOGY.—W. S. J. Shaw^{1,2} advances the view, based upon his experience of the Parsee stock in India, that 'in-breeding' is an important cause of dementia præcox. Since the Parsees left Persia in the eighth century, the intermarriage of cousins has not been only common but usual, the main object being 'to keep the money in the family'. This people constitute a small and clear-cut group in the immense Indian population, and among them marriage with outsiders, and proselytism, are strongly discouraged, while their environment, from a European standpoint, is as a rule far superior to that obtaining among other Oriental peoples. The following table shows the types of mental disorder in the writer's last hundred admissions at the Central Hospital for Mental Diseases, Poona, and of his last fifty private cases :—

| TYPE OF MENTAL DISEASE | HOSPITAL CASES | | | PRIVATE CASES | | |
|--|----------------|--------|-------|---------------|--------|-------|
| | Male | Female | Total | Male | Female | Total |
| Dementia præcox .. | 35 | 17 | 52* | 13 | 11 | 24* |
| Manic-depressive .. | 11 | 6 | 17† | 1 | 2 | 3† |
| Insanity with epilepsy .. | 3 | 0 | 3 | 2 | 1 | 3 |
| Dementia (secondary) .. | 10 | 11 | 21 | 4 | 3 | 7 |
| Paranoia .. | 1 | 0 | 1 | 1 | 0 | 1 |
| General paresis .. | 1 | 0 | 1 | 2 | 0 | 2 |
| Insanity due to ganja (<i>Cannabis indica</i>) .. | 1 | 0 | 1 | — | — | — |
| Idiots and imbeciles .. | 4 | 0 | 4 | 5 | 5 | 10 |
| Total .. | 66 | 34 | 100 | 28 | 22 | 50 |

* Including all varieties.

† Including involutinal melancholia.

Some of the cases were probably originally schizophrenics, but the history given was too vague for any such diagnosis. The percentage of discharges as recovered among these Parsee hospital cases was 6, although the annual average of all classes was just over 50, and it was a common subject of inquiry on the part of the staff why no Parsee ever recovered. Though the incidence of dementia præcox is high, the writer does not think that insanity in general is especially prevalent amongst Parsees. He suggests that the continuous mating of cousins, irrespective of any conceivable common taint, might tend to produce dementia præcox. He thinks it possible that similar germ-plasms or organisms of like unit character may be in some way mutually injurious. In any case he feels that the Parsee stock is now so seriously tainted with

dementia præcox that the propriety of their abandonment of the mating of cousins should be seriously considered. The subject is one of the highest importance, both sociologically and eugenically, as dementia præcox is the form of mental disorder which, owing to its relative incurability, keeps our mental hospitals full. It is possible that research into the mating of cousins may be undertaken in other fields, but the writer feels that in the field he has discussed it is certain that but little further result can come from inquiry, unless it is carried out by a Parsee of unusually altruistic type.

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DENGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

N. Kyriazides¹ records observations on the effects of a coincident attack of dengue on the progress of surgical inflammations, and concludes that this fever increases the tendency to the occurrence of suppuration, and even of septicæmia, and retards the healing of wounds. A relative lymphocytosis was noted; the diminution in the total leucocytes decreases the opsonic index, and the phagocytic power of the blood is reduced. These harmful changes may persist for twenty days after the cessation of the dengue fever. J. Aravantinos,² working in Athens, noted that nearly 60 per cent of dengue patients suffer from albuminuria, the albumin varying from a mere trace to a large amount. It may persist for a week or more after the fever has ended, but the prognosis is good on a suitable Diet, from which meat soup should be excluded, and milk foods and vegetables given.

REFERENCES.—¹*Presse méd.* 1929, Sept. 21, 1233; ²*Jour. Trop. Med. and Hygiene*, 1930, Feb. 15, 55.

DENTAL CARIES AND PYORRHEA ALVEOLARIS, ETIOLOGY OF.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

DENTAL CARIES.

In an age when research is playing such a big part in modern treatment and the elimination of certain pathological processes, why is it that dental caries is still so universally found and stands as the commonest pathological process that the human being is heir to? The answer to this apparent enigma is twofold: (1) The findings of various eminent researchers into the problem are not agreed as to causation; (2) Any evidence that has been proved up to the present day in the laboratory and clinically is not taken much note of by the lay public. The problem has been approached from different angles—such as the school who prove to their own satisfaction that the cause is extrinsic, and their colleagues who try to show that the mischief is intrinsic. Many eminent men such as Pickerell, Sherman Davies, Sim Wallace, Mellanby, Rosenow, Howe, and quite recently Broderick, have experimented and written on this widespread havoc of tooth caries.

From a general standpoint we know that calcium metabolism is intimately associated with proper development. From the dental point of view we are all familiar with the soft, chalky, and in many cases hypoplastic teeth. If the history of these poor dentitions is carefully inquired into, one finds definite diseases, such as syphilis, the exanthemata, rickets, etc., or imperfect artificial feeding, in many cases in unhealthy and unhygienic surroundings, in the background. This extensive evidence surely leads one to suppose that there is an intrinsic factor at work whereby the tooth substance is imperfectly formed.

For many years the view has been generally accepted that the exciting cause of dental caries is bacterial—in other words, the fermentation of carbohydrate foodstuffs in the mouth. Whatever the researchers may say about causes

predisposing to caries, the fact remains, and has been abundantly proved by diet control, that carbohydrate decomposition plays havoc in many mouths.

Barton lays great insistence on proper breast feeding for all children. If that is impossible, then pure cow's milk should be given rather than dried or tinned food. He says: "The better the state of any child's teeth, the older will that child be before it has to go to a dental surgeon, consequently the dental surgeons have but little opportunity of preaching prevention." Assuming that all or most children are breast-fed, the destruction of the milk teeth and of the erupting permanent teeth is largely due to sweets and sticky food-stuffs, with which all modern children are plied at all times of the day, to the utter corruption of those teeth. Barton's observation of children, and his clinical findings including the dentitions for fifty-odd years, fall very much into line with both the intrinsic and extrinsic schools of thought.

Howe, of America, has been actively engaged in experimental laboratory investigations for many years, and never likes to accept theories that have no practical background. He is prepared to allow that the bacterial element, the stress of modern living, too little time spent in fresh air and sunlight, and various mechanical faults which alter developmental tendencies, may all be factors. As a result of much study and experiment he is, however, convinced that the original underlying primary cause of many of our troubles is faulty diet. When foods have been tested in living animals it has been found in a few instances that very definite effects on the cells are obtained. For example, a deficiency of fat-soluble A causes the odontoblasts to lay down bone instead of dentine. Glandular and duct epithelium is replaced by a common type, i.e., stratified, keratinized, and desquamating. Glands, including the salivary groups, thus become unable to function normally, and the saliva may be changed. An antiscorbutic vitamin deficiency will cause these same cells to cease forming dentine, and the pulp tissue shrinks away from that already formed. If the deficient diet is continued, the formed dentine is absorbed and liquefies. On administering orange-juice new formation begins in twenty-four hours, and the space between the pulp and the old dentine is replaced with new dentine. The text-book disease, scurvy, is rare nowadays, but it is possible that a latent unrecognized scorbutic condition is very prevalent. Pasteurization of milk destroys this vitamin factor. Howe finds that animal after animal fed on a diet deficient in both these constituents—namely, the fat-soluble A and the antiscorbutic vitamin—have defective teeth. While there has been an enormous amount of work designed to find a diet of properly chosen foods that will produce a perfectly normal animal organism, the disagreements among investigators and the finding of new food elements such as vitamins clearly show that we are still uncertain as to the relative importance of many food factors.

Sherman Davies, another investigator, states that "modern diets are more deficient in calcium than in any other factor". The calcium needs of the body cannot of necessity be met by the simple process of supplying lime in large quantities to the alimentary canal; absorption, assimilation, and fixation are complicated processes. There is a prevailing idea that we require large protective amounts of protein. Howe's experiments with guinea-pigs show that a high protein diet results in poor, fragile teeth, with pitted enamel. Let us remember that human milk, the most perfect food for bodily requirements during the most rapid development, contains only 2 per cent of protein, whereas cow's milk contains 4 per cent. Howe concludes one of his papers on the subject by saying that on the whole his experience in feeding laboratory animals leads him to believe that the outstanding fault in our diet is the excessive use of meat and cereals, to the exclusion of sufficient fruits, vegetables,

and milk. The latter foods contain vitamins, minerals, salts, and low protein, and with the experimental animals produce sound teeth and bones. Primitive races, with their markedly better dentition, are ignorant of calcium lactates and parathyroid extract. They do not devitalize their foods by processes of refining and preserving and then try to replace the deficiencies by chemical makeshifts.

Sherman Davies, in testing the blood of children and adults presenting themselves for dental treatment, finds 77 per cent are suffering from secondary anæmia and a persistent and long-enduring calcium imbalance. His principle of treatment to combat these two conditions is fundamental—that is, nothing can be done in the restoration of tissue without a normally constituted blood-stream. The anæmia therefore receives attention. The nutritional problem is, How can the necessary amount of iron be supplied in order to prevent secondary anæmia? No individual can build normal blood who does not take into his body an adequate amount of **Pyrrol** derivative compound. Hæmatin is composed of four pyrrol nuclei, which must come from the outside (contained in the food) and are bound together by one atom of ferric iron. The food, however, must contain a very small amount of catalyst effectively to combine pyrrol molecules with ferric iron to build hæmatin, in this case either copper or manganese. Therefore an individual who is not getting an adequate amount of pyrrol and whose diet does not contain something carrying copper or manganese, must develop secondary anæmia. There is no mother's milk which is adequate for the normal nutrition of the child unless she has dieted carefully beforehand. Nature stores in the body of the child elements which will not be in the mother's milk. When that condition has been adequate and well balanced, the child will not suffer from secondary anæmia.

To illustrate the problem of food composition which is involved in nutritional imbalance, every child from the third year onward requires 15 mgrm. of **Iron** every day. If the child should depend entirely on milk, 2½ gallons would have to be drunk, or meat eaten to the extent of 600 grm., or eggs 600 grm., or wheat 400 grm., or spinach 600 grm. Davies finds pyrrol is supplied abundantly in **Green Vegetables** and also in the **Alfalfa** plant. In his clinic he extracts pyrrol from this plant and gives small doses in honey twice a day to the children. In addition iron with a little catalyst copper or manganese is prescribed. A case of a man 72 years of age suffering from pernicious anæmia is very startling. The patient was taking liver extract, but gradually getting worse. Pyrrol and the iron with manganese in syrup form was prescribed. A blood-count revealed that in sixteen days from the commencement of this treatment the patient had made 1,168,000 red cells per c.mm. In addition to the red-cell count being raised to 5,000,000 it was found that the morphology had returned to normal. Davies goes on to state that he has never treated a case of secondary anæmia in children that was not restored to the normal in two or three weeks.

Having obtained a normal blood, the recalcification of dentine is considered. Milk (1000 c.c.) is prescribed not only for the **Calcium** it contains, but also because of the high degree of assimilation it induces in young children. In addition to calcium the intake of phosphorus has to be considered. Bone cannot be formed without the phosphorus. Wheat is rich in phosphorus and poor in calcium, therefore **Milk** is combined with an abundance of **Wheat**. Davies has prepared a 5-gr. tablet made up of **Calcium and Pyrrol** in the ratio in which they are to be found in dentine. These are taken twice a day and give two-thirds of the requirements. The diet is trusted to make up the other third. An overdose of these elements is not of any moment, as the body will use what it requires—how we do not know—and eliminate what is unnecessary.

The article concludes with some remarks on the conditions necessary for the assimilation of calcium. Nervous equilibrium plays a big part here. The activator required is found in direct **Sunlight, Ultra-violet Rays, or Cod-liver Oil**, containing vitamins A and D. Cases have been taken where the dentine was as white and soft as cheese. At the end of five months of treatment on these lines it has become perfectly normal, yielding the characteristic polish. In seventy-five cases where the teeth were absolutely condemned, after five months they were passed as safe. I have stressed the diet theory in the etiology of dental caries, as it is obviously a very important one—probably the most important.

PYORRHŒA ALVEOLARIS.

Prevention of disease in the main requires very accurate knowledge of its causes and pathogenesis. The reason why we cannot prevent dental caries is because we do not yet know exactly the causes of pathogenesis of susceptibility to the disease. Similarly we cannot completely prevent chronic periodontoclasia or pyorrhœa alveolaris because some of the causative factors are still unknown. The etiology of this condition can be grouped under three headings: (1) Bacterial invasion from the tooth surface; (2) Slowly acting mechanical injuries; (3) Lowered vitality in the periodontal tissue cells. Each of these factors is capable of subdivision.

1. **Bacterial Invasion.**—Gottlieb finds there are very few sections of gingival tissue not showing microscopic evidence of bacterial invasion at the base of the gingival trough. In an unbrushed mouth Kligler and Gies found six to eight hundred million bacteria per mgrm. from the scrapings of the tooth surfaces. The exudate from an inflamed gingival trough gives rise to deposits of seruminous calculus which in itself is highly irritating. Likewise an overhanging filling edge or crown makes an ideal spot for bacterial growth, and furthers chronic stagnation; thus a vicious circle is set up. To combat this bacterial factor, careful and very thorough brushing of the teeth is essential. In addition, prevention involves moderation in eating, regularity of eating habits, the use of fibrous cleansing foods such as acid fibrous foods and vegetables, and a limitation of foods that tend to produce coatings on the teeth after eating.

2. **Frequently Repeated Trauma.**—One type of this, which at the same time is associated with bacterial irritation, is the impaction of food into the interdental tissue owing to faulty contact points, occlusal wear, twisted teeth, or separations. Food fibres impinging on the interdental papilla of gum cause a pressure atrophy leading to recession; but more important still is the bacterial irritation from the putrefying organic matter causing deep inflammation and loss of interproximal bone. The tendency for fibres of food to wedge between the teeth is aggravated by the toothpick habit, fortunately now less common than formerly. Food-wedging should always be relieved by the routine use of dental floss silk, which does not injure the gingivæ.

A more purely mechanical irritant is the so-called traumatic occlusion or maladjustment of the teeth to each other, in which they are subjected to stresses greater than the supporting structures can withstand, or coming from a different direction. In considering this factor the principles of bone formation and developments in other parts of the body should be studied. Pyorrhœa alveolaris is as involved in this problem as orthopædic surgery. The physiological points at which overstress or understress causes bone absorption are greatly modified by metabolism, absorption occurring much more quickly if bone metabolism is faulty. Applying these facts to the alveolar

bone supporting the teeth, we find that bone is built up at the time of tooth eruption to resist the stresses to which the teeth are subjected. In persons or races where mastication is heavy, the alveolar bone is thick and the bony plates round the teeth are numerous. If function is lost in a tooth, the radial bony plates at the apices gradually resorb. If stress is again placed on the tooth, it gets sore and rapid bone absorption occurs. If a tooth is lost, the remaining teeth tend to shift their positions, tipping over into the space. The alveolar supporting bone then receives stress from the side different from that intended by nature, the bone may build in new plates and accommodate itself, but if metabolism is poor resorption may occur rapidly. Prevention of this traumatic factor is obtained by: (a) Building heavy bone by heavy mastication during the developmental period of the teeth and jaws; (b) Keeping the teeth in their original masticatory functions by replacing lost teeth and maintaining contact points and functional occlusal surfaces; and (c) Maintaining the bone metabolism at the highest possible point by proper dietetic measures so far as they are known. In this connection it is important to remember that orthodontic procedures are of great use in correcting retarded growth and developing the internal structure of the bones of the jaws.

3. Lowered Vitality of the Periodontal Tissue Cells.—This factor has been partly considered in discussing resistance to bacterial invasion. The gingival and periodontal tissues are particularly subject to faulty circulation, stasis, and congestion. Apart from careful hygiene, artificial massage of the gingivæ with the tooth-brush or fingers is very helpful.

Systemic disease and lowered vitality may first manifest themselves in the periodontal tissues. In these tissues infection is present as bacteria are always invading them. Unless the disease is progressing, the organisms are being repelled by the tissue cells. Worry, overwork, influenza, diabetes, nephritis, tuberculosis, syphilis, etc., all interfere with cell metabolism and predispose to periodontal disease. They probably act in two ways, producing toxic agents and interfering with the normal metabolism of the body. It is reasonable to suppose that in modern man, whose calcium in the diet is close to the borderline of deficiency, and whose calcium-activating vitamins are also likely to be low, the calcium is frequently on the negative side from worry, overwork, or systemic disease. Howe, Grieves, and others have produced chronic periodontal disease in white rats and monkeys, normally immune, with diets slightly deficient in lime and one of the activating vitamins.

Having recognized the need of proper food for the expectant and nursing mother and the growing infant, we can at least say that one of the most important factors is the education of the people. In this connection I wish to draw the attention of the medical and dental professions in this country to the introduction of dental nurses or hygienists in America. The majority of the States have taken up this addition to the public dental service. Schools for training these women are springing up all over the country. The principal occupation for such nurses consists in working systematically through the schools, cleaning, scaling, and examining the teeth of each child every six months. At the same time they talk about diet and tooth cleanliness to the parents and children. Any defects noted at these regular and repeated examinations are recommended to a private dental surgeon or a clinic. In Rochester, New York State, to take an example, the whole population has become more interested in dental matters—the children lose all dread of the dental chair, and when the time comes for a cavity to be filled they are far less difficult to manage.

Britain is far behind America in recognizing the importance of parental instruction and very early dental supervision of the children. Our somewhat

inadequate public dental service takes up the work too late, and many teeth are found to be beyond repair when the patient eventually reaches the dental surgeon. The lack of a systematic follow-up with half-yearly inspection is to be deplored, as the children have no opportunity of getting used to dental treatment and becoming alive to its importance. After leaving school they do not continue the periodical and regular dental inspection. Unfortunately at present our public dental service has no provision for dealing with those between the ages of 14 and 21—a most critical time in the mouth, as the permanent dentition goes down the road of disease fast.

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DENTAL SEPSIS.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

In 1900 Dr. William Hunter showed the medical profession the importance of dental sepsis as an etiological factor in the causation of systemic diseases. Up to that time teeth were regarded from the physiological standpoint as being aids to mastication, little or no attention being paid to the far-reaching pathological effects which might result from the diseased periodontal tissues surrounding an infected tooth. It may be unhesitatingly said to-day that the theory of dental sepsis as an etiological factor in the causation of systemic disease stands on a firmer foundation than ever.

MODE OF ACTION.

Direct Local Infection of Other Organs.—The tonsils, nasopharynx, and the maxillary antra may all be infected by the teeth. The swallowed organisms may set up inflammatory conditions of the gastro-intestinal tract, causing gastritis, gastric and duodenal ulcer, enteritis, colitis, appendicitis, cholecystitis, etc. A. F. Hurst has pointed out that achlorhydria may be a predisposing factor in the causation of infection of the gastro-intestinal tract. In the mouth itself one occasionally sees marked enlargement of the alveolar processes due to a septic periostitis.

Blood-stream Infections.—This mode of transference of the organisms or their toxins appears to be the usual channel by which disease in other organs is produced. Sir William Willeox quotes from his records cases of acute, subacute, or chronic toxæmia, acute septicæmia, or even pyæmia, secondary anæmia, pernicious anæmia, leucocytosis, and more rarely leucopenia. The organisms most commonly responsible are the streptococcal group: (1) 'Viridans', being commonly associated with the production of chronic rheumatism; (2) 'Indifferent', shown recently to be definitely associated with systemic disease such as chronic rheumatic conditions, infective endocarditis, etc.; (3) 'Hæmolytic', causing severe toxæmia and anæmias; (4) 'Anaerobic', associated with chronic rheumatism. Each of these four groups includes many varieties, and these may produce different clinical manifestations. Staphylococci are very rarely found in infected roots of teeth; they are much more commonly associated with nasopharyngeal infection. The *Bacillus acidophilus odontolyticus*, isolated in 1922 by McIntosh, Warwick James, and Lazarus Barlow, may be the actual cause of dental caries, but it has not been associated with resulting systemic diseases.

Factors influencing the Effects of Dental Sepsis.—The effects of dental sepsis depend on the nature, rate, and amount of toxic absorption, and also on the immunity of the patient to the absorbed products of infection. Thus one has to consider:—

1. *The Virulence of the Organism.*—An estimate can be gauged by the toxic effects of a given dose of vaccine on a healthy individual. The varying degree of virulence in the organisms producing dental sepsis shows how important it

is to begin with very small doses when vaccine treatment is being given. A large dose of a vaccine from a virulent organism may cause a harmful effect, and indeed completely destroy the immunity of a patient.

2. *The Amount and Rate of Toxic Absorption.*—When there is free drainage the toxic symptoms are often of low degree. If the sepsis is 'closed', the products of the septic focus pass directly into the blood-stream by way of the lymph, and may cause marked toxic effects.

3. *The Immunity of the Patient.*—The resistance of a person to a dental infection may be completely broken down by the constant dosage of toxic products into the blood-stream. A condition of sensitization results and marked general reaction may follow comparatively small doses of the toxins. This may show itself by the occurrence of skin rashes, such as erythematata and urticarial eruptions, attacks of asthma, gout, or angioneurotic oedema.

In sensitized patients a very minute dose of vaccine will produce severe reaction. If sensitization exists, the first step is the removal of the septic focus. In addition to this Sir William Willcox has recently tried with success the intravenous injection of small quantities of **Immunized Blood** every three or four days for about five doses. This is followed by an **Autogenous Vaccine** in small and gradually increasing doses at intervals of five to seven days. The immunized blood is obtained by inoculating a healthy donor of suitable blood-group with the autogenous vaccine of the patient. The overcoming of the sensitization is accompanied by marked clinical improvement in the systemic condition.

A study of cases of dental sepsis shows how little separates health from disease. A slight cause may transform a condition of apparent health to one of acute and painful illness. Thus overwork, over-exertion, mental anxiety, inadequate diet, impure atmospheric surroundings, or an overdose with vaccines may completely break down the immunity of a patient and cause severe systemic effects. Symbiosis also plays its part. Dental sepsis, by reason of its resulting toxemia, may enhance the recurrence of diseases which otherwise would yield quickly to treatment. As an example, boils due to a staphylococcal infection are apt to recur constantly over long periods if associated dental sepsis is present.

Radiographic evidence to follow up the clinical examination of the teeth and gums is essential. The importance of periapical necrosis is fully realized, but alveolar erosion and general rarefaction or condensation of bone round infected teeth are worthy of equal attention.

SECONDARY INFECTIONS ARISING FROM DENTAL SEPSIS.

Attention has been drawn to the occurrence of these as a direct transference of organisms to the nasopharynx or alimentary tract. Willcox finds that on bacteriological examination in 90 per cent of the cases where dental sepsis has existed for over a year similar organisms are found in the intestinal tract. It is important to realize the part played by secondary infections, because they may carry on the infective process after the dental sepsis has been removed. These secondary infections always require treatment, otherwise the systemic effects of the original dental sepsis may fail to show improvement.

Evidence for the Conclusion that Dental Sepsis is the Source of Infection.—The most careful investigation must always be made in every case of disease which may be due to dental sepsis before incriminating the teeth. All other possible primary foci of infection must be excluded. When this is done the evidence from the clinical and radiographic examination of the teeth must be carefully considered. It must be remembered that dental

sepsis causes a streptococcal toxæmia. A toxæmia of an exactly similar nature may arise from a focal infection in other parts of the body. Having decided that the mouth is to blame, the necessary dental extractions must be carefully considered. When the immunity is low, it is wise for only one or two teeth to be removed, the patient being kept in bed under observation. In some cases a marked pyrexia and severe systemic reaction follow. This calls for an interval of two or three weeks before any further operative treatment is carried out. Several instances of a fatal septicæmia and malignant endocarditis following the extraction of infected teeth in a patient in poor health and with a low immunity have been recorded.

In some cases presenting definite systemic effects for which no cause can be assigned but the teeth, there may be only slight evidence of dental sepsis from the clinical and radiographic examination. In such cases, if the final, careful consideration condemns the teeth, they should be removed. Often in instances of this type there has been previous gross infection of some teeth which have been removed. In such cases some of the remaining teeth may carry on the infection and show only slight signs from the combined examination.

The extraction of teeth without adequate evidence that they are the causal factor in the illness cannot be too strongly condemned. One not uncommonly sees cases of arthritis in which all the teeth have been extracted and yet the disease progresses without interruption. In such cases some other causal factor is present, and this can always be discovered by a sufficiently careful investigation. Lastly, one must remember that dental sepsis may be secondary to some other disease or toxæmia such as the gingivitis associated with scurvy and the excessive administration of mercury. Willcox's conclusions are as follows:—

1. Dental sepsis is the commonest form of infection in the body and must be regarded as one of the most frequent sources of disease in adult life. It is of great importance in relation to illness in the pre-adolescence period.

2. Dental sepsis, by reason of the great advances in medical and dental knowledge, can be diagnosed with accuracy, and its causative effect in various diseases can be gauged.

3. The dental surgeon, with whom must rest the final decision as regards dental extraction, plays a most important part, not only in the essential treatment of most of the common prevalent diseases, but also in the prevention of the many illnesses which may arise from untreated oral sepsis.

Much stress is laid on dental infection as the most usual site of focal sepsis, and the frequency of the occurrence of apical abscess which is not sufficiently realized by the medical profession. MacCallan reports on a series of 100 consecutive refraction cases seen in private practice with full vision after correction with spectacles. The series commences from Aug. 27, 1927, and includes all private patients whose vision could be improved to 6/6 or 6.5; 39 patients are excluded from the series, as they did not attain 6/6 or 6/5 after correction, owing to obvious pathological changes in the eyes. The series are as follows:—

| | |
|--|-------|
| Abscesses at roots of teeth | 22 |
| Other dental conditions also requiring dental surgery .. | 19 |
| Dental cyst with apical abscesses at roots of teeth .. | 1 |
| Appendicitis requiring operation | 1 |
| Enlarged septic tonsils requiring operation | 2 |
| Suppurating antrum with septic teeth | 1 |
| Already under medical or dental treatment | 13 |
| Refused advice as to obtaining medical or dental treatment | 7 |
| Examination incomplete | 8 |
| Uncomplicated ametropia | 26 |
| | <hr/> |
| | 100 |
| | <hr/> |

The cases were drawn from the ordinary upper middle class, with the exception of six, who were seen under the National Health Insurance Scheme. The large majority had their own dental surgeons to whom they paid visits from time to time. MacCallan found that the most serious lesions were seen in the cases with apical dental abscesses.

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DENTISTRY, CHILDREN'S. (See also DENTAL CARIES AND PYORRHEA ALVEOLARIS, ETIOLOGY OF.)

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

A very interesting article on this subject written by three American physicians appeared in February, 1930.¹ The authors conclude by saying: "The duty of every community is to assist every child to make the most of its gifts. The first, and the one on which all the others come to depend, is health. No child is in a perfect state of health with disease in its mouth. Therefore in every community the best possible dental service should be offered to children. The part the physician plays in bringing about this much-to-be-desired condition is large."

Physicians the world over are conversant with the following facts: (1) That 'tooth caries' is essentially a disease of early life; (2) It is more prevalent than any other disease; (3) Its subsequent spread to the tooth pulp, followed by toxins or bacteria or both into the bone, blood-stream, and lymphatics brings active warfare to the patient's natural resistance to disease; (4) The early removal of diseased teeth in the primary dentition upsets the normal development of the permanent dentition, leading in many cases to excessive crowding of the teeth and narrowing of the arches.

As the result of a recent visit to America in which I had an opportunity of studying the science and practice of dentistry in many different places, I am of opinion that the Americans as a nation are tackling the problem of dental diseases in children more efficiently than the European countries, including Britain. A more determined effort is made to get in touch with the children as early as possible. Systematic oral hygiene is taught in many of the schools. Thirty of the forty-eight States have recently introduced dental hygienists. These women pass through a modified course of instruction in oral hygiene and pathology, sterilization, dietetics, radiography, and the scaling, cleaning, and examination of the teeth. On receiving a certificate the hygienists are employed in the schools and also in private practices. The school work consists of routine cleaning, scaling, and examination of the teeth. Any children showing dental defects are advised to apply for treatment at a recognized clinic or with a private practitioner. This cleaning and examination are carried out every six months or every year. The follow-up is therefore extremely thorough. By systematic work of this nature the average child becomes interested in dental matters, and, realizing that good teeth are a very important asset, takes a pride in keeping them clean and in good order. Another important point is that the child gets used to the so-called horrors of the dental chair and submits much more readily to the first filling operation. During my visits to different dental schools, hospitals, and clinics I was very much impressed with the infinitely better-kept mouths than one sees in England. Another feature of American dentistry is the specializing. Many practitioners confine their professional activities to children and carry out splendid operative work.

In England the family physician has been well called the family friend. He has an excellent opportunity of educating his patients. Parents can be

taught to appreciate the value of children's dentistry better by the physician than by anybody else. They are accustomed to hear his advice on problems of health, and in this instance it has the added weight of being devoid of self-interest. Many parents are not aware that the deciduous teeth are not all lost at or near the sixth year. When told that the second-year-old molar is not lost until the age of nine and sometimes not till fourteen, they will be more impressed. Then again the two-year-old molar lives next door to the permanent six-year-old molars for four or five years. If it starts to decay it will probably infect the permanent teeth. If the two-year-old molar is neglected and attacked severely by caries, it will be lost very early and the six-year-old molar will move forward in the dental arch, thus diminishing the space allotted for the bicuspid and canines. To use an American phrase, the average United States citizen is 'tooth-minded', and the average Briton is not. The American consults his dentist before he gets pain, thus enabling the dentist to conserve the teeth. The average Briton waits until he has got toothache, and in order to avoid the modern bugbear—a dead tooth—has to have it removed. Eventually he has to submit to the discomfort of dentures in comparatively early life. Many Americans said to me, "What bad teeth you English people have, and what a lot of obviously artificial dentures one sees!" A layman's remark of this sort explains the whole situation in a nutshell. There is no getting away from the fact that preventive dentistry is the thing to aim at, and it is after all the only cheap dentistry. Let us not forget that without a dry surface, a good light, and a sharp probe, backed up in some difficult cases with a radiogram, one cannot be sure there is no carious cavity in a tooth.

In these general remarks I would venture on another difficulty that doctors may meet with. I refer to the blackened surfaces seen in many deciduous and occasionally permanent teeth. Apart from the various stains, many of these darkened areas are evidences of arrested caries, but this cannot be proved without a careful dental examination. Another direction in which the family doctor plays a part is the all-important one of diet. Good sound bone- and tooth-building diets are the backbone of preventive dentistry.

In order to be effective, preventive dentistry must be kept up at regular intervals. Dental surgeons should get more into the way of making return appointments every four or six months, and the family doctor can do much in urging the parents to keep them. Even if three or four visits are paid and no operative work is found to be necessary, it does not mean that one should discard this excellent routine. Prevention is always better, and in this case cheaper, than cure. It would be a step forward if all general practitioners would persuade their child patients to visit their dental surgeon after acute illnesses such as the exanthemata. On many occasions I have been very much impressed with the rapid destruction of the tooth substance that takes place after such illnesses as measles, scarlet fever, etc.

Dental surgeons need to be taught and encouraged to do good dentistry for children. It is the most exacting and trying work of all. Certain practitioners are slipshod, careless, and half-hearted, and frequently avoid giving pain, to the serious detriment of good sound work. This type of practice is to be deplored, as parents find that the fillings do not last or actually fall out. It is helpful to all concerned if the family doctor, on looking at the child's mouth, comments favourably on good, well-polished fillings.

In conclusion, one would stress the importance of orthodontia, or the regulating of crowded teeth with derangement of the jaw positions and bite. In cases of adenoid obstruction it does not follow that removal will cure the mouth-breathing and cause the jaws to assume the normal. A close

co-operation of the nasal and dental surgeon in all these cases is much to be desired. Practically all children who have their adenoids removed after the age of six should be handed over to the dental surgeon afterwards. In many of these cases careful orthodontic treatment will relieve the damage already done to the jaws, and eventually lead to more perfect nasal breathing.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1930, Feb.

DENTISTRY, RADIOGRAPHY IN.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

Modern medicine and surgery cannot do without the help afforded by X-ray examination. Up-to-date and scientific dentistry is not complete without it, and the help afforded by such pictures is equally useful to the dental practitioner and the doctor. At the outset the radiogram is but one link in the diagnostic chain—its value is directly proportional to its proper usage. To condemn or to exonerate questionable teeth upon their radiographic appearances is to do so upon insufficient and sometimes faulty evidence. A very careful and thorough clinical examination is essential in all cases. Dental surgeons and their patients occasionally suffer when a doctor, after a cursory inspection of dental films, expresses an opinion, sometimes founded on an incorrect interpretation, contrary to the considered advice of the dentist. It is highly desirable, therefore, that the doctor should be versed in the interpretation of dental radiograms, so that he can correlate them with the clinical reports and decide on appropriate action.

Though dental sepsis may not be sufficiently potent in certain cases to cause a secondary lesion, it is capable even in mild degrees of swinging the balance, and it may also put a drag on recuperation. Dental radiograms should therefore be taken in all cases of debility or chronic ill health. The pictures themselves, perhaps more than any other types of radiograms, must be the best possible. There are many factors causing distortion of the images: (1) The angle at which the picture is taken; (2) The amount of curve given to the film; (3) The variations of the dental arches and palates of different individuals. Points to note carefully and likely to lead one astray in pictures of the jaws are as follows:—

In the Maxilla.—

1. The delineation of the antrum. A thin layer of hard bone surrounds a translucent area above the molar and premolar teeth. The sinus occasionally extends as far forward as the lateral incisor, and may be mistaken for an area of pathological destruction, especially when septa dividing it into loculi are present. Conversely, a small dental cyst invading the antrum may easily be mistaken for a loculus of that sinus. In these cases stereoscopic plates and a comparison of the two sides are helpful in avoiding such errors. A large dental cyst displacing the floor of the antrum upward and filling the entire space may also be unrecognized if considered apart from the physical signs. (*Plate IX, B.*)

2. The malar process often casts a radiopaque shadow over the apices of the last molar teeth, preventing clear definition. It should not be mistaken for an area of pathological sclerosis.

3. The tip of the coronoid process sometimes appears on an upper molar film.

4. The median suture, the anterior palatine canal, foramen, and fossa may all be mistaken for periapical destruction above one or other of the central incisors, especially when the tooth is known to be pulpless. (*Plate IX, E.*)

5. The nasal septum may throw an opaque shadow across the roots of the upper incisors, and the nasal fossæ are sometimes seen in close relationship to the apices of the central incisors.

6. The canine fossa over the lateral and canine varies in depth, and hence shows variations in radiolucence.

In the Mandible.—

1. The inferior dental canal extends forwards below the roots of the molars and premolars. Disease of these teeth is frequently a source of trouble persisting indefinitely after extraction. The canal is very close to the third molar, and the roots of this tooth have been known to be grooved or the nerve actually to pass through them.

2. The mental foramen is seen as a translucent area between the apices of the bicuspids. It is frequently so close to one of them as to simulate a pathological rarefied process associated with the tooth. Pictures taken from different angles and careful tracing of the inferior dental canal to the foramen may be helpful. (*Plate IX, A.*)

3. A band of opacity from the mylohyoid ridge and the external oblique line may sometimes be seen in the region of the lower molars.

The radiographic appearance of infected bone in osteomyelitis and tuberculous disease is established and proved. The changes which occur in the bones of the jaws when these are infected from the mouth are essentially the same, although in the vast majority of cases the process is much more chronic. Yet the fine details of a dental radiogram render the detection of even small localized patches of infected bone quite possible. The alterations produced in the bone as the result of infection are three: (1) Thickening of the trabeculae, with reduction in size and shape of the intertrabecular spaces, i.e., sclerosis; (2) Rarefaction of the trabeculae with the necessary enlargement of these spaces; (3) Destruction varying from the loss of a few of the bony trabeculae to the production of macroscopic cavities in the bone. Sclerosis may be regarded generally as a defensive reaction of the bone to the advance of infection. Rarefaction and destruction, then, will be regarded as a comparative lack of defensive power of the bone to the advance due either to relative weakness of the tissues or to relative strength of invasion.

After a general inspection, the radiograms should be examined in a special 'viewing-box' and with a lens. Special attention should be paid to the following:—

1. *The Crown.*—The enamel is clearly defined as a cap of denser material covering the exposed portion of the tooth, being thickest in the cusps on the masticating surface, and thinning to its termination at the neck of the tooth, where it ends in a delicate edge, having no projecting ledge or sudden break. Good fillings and crowns should imitate this smooth continuity of surface from root to crown as closely as possible, otherwise stagnation of food occurs at this rough place, with injury and infection of the subjacent periodontal membrane, and ultimate caries in the root deep to the filling. Caries beneath a filling may be seen as a translucent (dark) area extending even down to the pulp. Another point to look for is the position of the crown relatively to its neighbours. A slight breach at the contact point leading to food impaction, or undue tilting of the crown interfering with proper cleansing, gives rise to caries and to periodontal infection. Subgingival tartar should also be looked for. (*Plate IX, D.*)

2. *The Pulp Chamber and Canals.*—Normally this is clearly defined with a definite outline. Unless the canal has been filled with a radiopaque material it is not possible to tell whether the pulp is alive or dead. Secondary dentine bulging inwards towards the chamber and pulp nodules may be seen; very rarely there is absorption of the dentine surrounding the pulp. Secondary dentine and pulp nodules may be a cause of chronic neuralgia.

3. *The Root, the Periodontal Membrane, and the Lamina Dura* should be

examined together. Normally the surface of the root is smooth and without excrescences or excavations, the apex being moderately pointed unless bending of the root toward or away from the ray hides it. The periodontal membrane between the root and the wall of the socket appears as a fine black line like a hair. The lamina dura of the socket is seen as a thin white line of compact bone covering the cancellous tissue of the alveolar processes.

4. *The Crests of the Interdental Septa* are formed by the junction of the laminae duræ of adjacent sockets where they join that covering the cancellous tissue of the septum. Between the incisor teeth the septal crest appears as a thin, elongated spine of hard bone (*Plate IX, C*). Towards the back of the mouth the interproximal spaces become broader, and the lamina dura passes horizontally across from the margin of one socket to that of the next (*Plate IX, A*).

5. *The Cancellous Tissue* should be carefully noted. In the maxilla the pattern is that of a fine, irregular, small-meshed honeycomb. In the mandible the trabeculae form large irregular spaces with a general tendency downward and forward in the premolar and molar region. It must be remembered, however, that the radiographic appearance of normal cancellous bone can vary considerably. The practice of radiographing suspicious teeth and ignoring edentulous spaces is not sound. One frequently finds a hidden focus of infection in these areas. At the Mayo Clinic all patients are submitted as a routine to a dental examination, which includes a full set of films.

Lastly, one mentions the profile radiogram in connection with the building out and restoring of outline of the soft tissues with artificial dentures. Where a number of teeth are to be removed and the bite-line interfered with, a picture of this nature taken prior to the extractions is very helpful.

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DENTISTRY AND RADIUM.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

The dentist in the past was concerned only with the diseases and treatment of the teeth themselves. The whole science of what has gradually become a special branch of surgery has undergone considerable change and advancement in this century, more particularly in the last few years. Dentistry in its various directions and forms of treatment has become so extensive that there is a tendency to specialize in one or other direction. This is exemplified in America. Whether the dental surgeon is practising general dentistry or specializing, the days of examining and treating the teeth, and the teeth only, are past. The dental student of to-day has a fairly sound training in the pathology of the mouth. In his daily practice he has unique opportunities of noting and examining departures from the normal in the oral tissues apart from the actual teeth. To take one instance, the importance of the early diagnosis of cancer and the steps that should be taken to avoid chronic sepsis and irritation are obvious. The increasing use of radium in oral cancer has opened up another field of activity in dental surgery. Colonel C. Howkins, of Birmingham, has written from time to time on this subject. I am indebted to him for much of the information and also the illustrations in this article.

The therapeutics of radium are but imperfectly understood. It is known that among other properties radium emits three recognized types of radiation—90 per cent alpha, 9 per cent beta, and 1 per cent gamma. The first two have not at present been made use of, and are screened off. They act equally on normal and malignant cells. The gamma rays penetrate deeply, resembling the Hertzian waves. These rays have a selective and destructive action on

PLATE IX

DENTAL RADIOGRAPHY

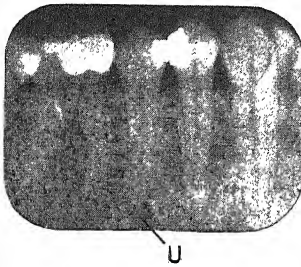


Fig. A.—Mental foramen and lamina dura horizontal between the teeth (U).

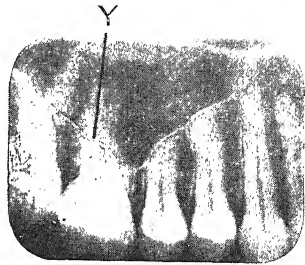


Fig. B.—Outline of maxillary antrum (Y).

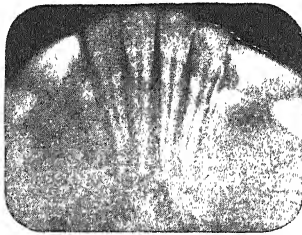


Fig. C.—Lamina dura pointed between the teeth.

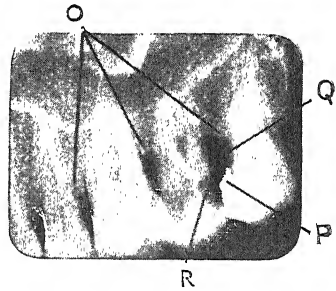


Fig. D.—Skelagram showing: O, Destruction of interdental bony septa; Q, Extensive cavity between roots of teeth and below filling (P); R, Distal cavity in molar.



Fig. E.—Anterior palatine foramen (W).

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PLATE X

DENTISTRY AND RADIUM

(C. H. HOWKINS)

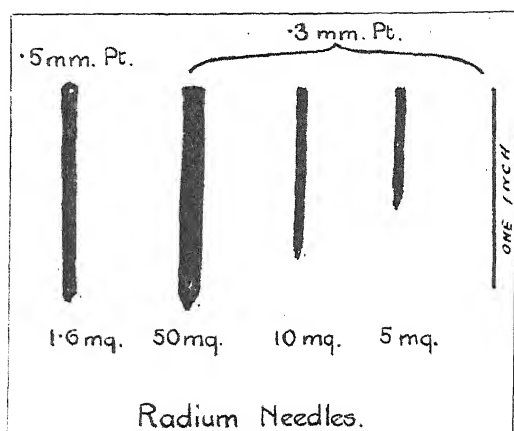


Fig. A.—Forms and sizes of radium needles.

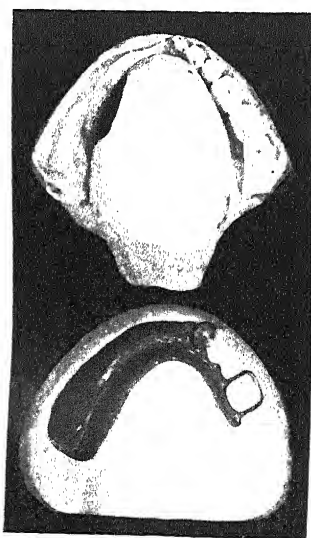


Fig. B.—Epithelioma of tongue, the protective lead being held by the teeth.

*By kind permission of Lt.-Col. C. Hawkins and the
'Proceedings of the Royal Society of Medicine'*

malignant cells. Radium sulphate is placed in hollow needles of platinum, which acts as a filter and cuts off the unwanted rays. These radium needles vary in size and shape from a gramophone needle to a service rifle bullet (*Plate X, A*). Another form of radium treatment is carried out by the radium gas emanations, or 'radon', collected in capillary glass tubes in platinum cases. These 'radon seeds' are buried in the tissues.

From the dental point of view the needles are utilized in two ways: (1) By burying them; or (2) Holding them in proximity to the growth.

1. In the first method some form of dental appliance termed a 'protector', holding sheet lead 1 mm. in thickness between the needles and the osseous tissue, is essential. These needles, varying in number from 5 to 20, are buried for eight to twelve days, the average dose being about 2400 mgrm.-hours.

2. In the second method, which may be termed 'surface irradiation', where it is impossible to bury the needles, some form of 'applicator' is made, the needle being placed some 12 to 15 mm. away from the tumour. This space may be conveniently maintained by a layer of dental impression material covering the needles. The exposure in these cases is longer, i.e., ten to twenty days; 5-mgrm. needles instead of 1-mgrm. are used, the total dosage being about 10,000 mgrm.-hours.

The following measures may assist in treatment:—

1. The removal of loose and broken-down teeth and excessive deposits of calculus. Experience has shown that it is not always wise to remove all the septic teeth and roots. Apart from gross sepsis and loose teeth, certain firm pyorrhœic teeth and roots giving no obvious trouble should be retained. By so doing increased stability may be obtained for the appliance, the tissues are less traumatized, and thus the risk of excessive burning is reduced to a minimum.

2. The removal of metal fillings, crowns, and bridges in proximity to the radium, in order to prevent secondary radiations, which may bring about necrosis.

3. The careful removal of loose sequestra.

4. The provision of some form of obturator to replace lost tissues.

5. Possibly the provision of dental splints in cases of considerable loss of bone, due to the action of radium, or radium treatment combined with surgical methods.

In designing appliances for radium treatment in the mouth, there are two factors to consider: (1) The holding of the radium in its correct position; (2) The limitation of its action (*Plate X, B*). A careful examination of the case together with the closest co-operation with the radiologist is essential. Difficulties that may be apparent to one and not the other should be discussed and thoroughly appreciated. It is important for the radiologist to see plaster models of the mouth so that the position and number of radium needles to be used may be settled. These may be inserted into shallow grooves and carefully fastened by thread, wire, or hard wax. The following may be useful in different cases: (1) Springs; (2) Bands on remaining teeth; (3) The appliance made in the form of a Gunning splint; (4) Upper and lower bite blocks coupled with a bandage to keep the jaws together. The body of the appliance is most conveniently made of vulcanite, with lead inserted to protect the parts not to be affected by the radium rays. During the emanation treatment the appliance should be taken out and carefully cleansed when necessary, a mild antiseptic mouth-wash being used at the same time. With many of the appliances in position, a soft diet is possible—in some cases, such as a Gunning splint, a hole may be cut in the anterior part.

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DIABETES.*Walter R. Campbell, M.A., M.D. (Tor.), F.R.C.P. (Can.).*

CLINICAL OBSERVATIONS.

It seems not unlikely that we shall use a larger amount of carbohydrate in diabetic diets of the future since we have insulin to metabolize it, but the most suitable amount has yet to be determined. Doubtless some diabetics have been allowed too much carbohydrate in the diet. That this has not been a preventive of acidosis, coma, or vascular sclerosis, and that carbohydrate tolerance is destroyed by overwork of the islets, should be evident to any competent observer. On the other hand, the thesis that fat is a cause of arteriosclerosis of diabetes is not supported by any evidence as yet, nor is there any danger of ketosis in properly balanced diets. Unless a diabetic is impressed with the view that indiscretions in diet ultimately lead to loss of tolerance, there is little doubt that he will have progressive diabetes whether he is on the high carbohydrate regimen or the low. One advantage in the latter is that the patient is not so much tempted to overeat. High caloric intake is a thing more to be feared than either high fat or high carbohydrate in the diet.

Influence of Muscle Work.—The possibility of hypoglycæmia supervening on unaccustomed exercise makes it necessary to provide for this by suitably regulating the insulin in severe diabetics. F. Hamburger¹ reports in tabular form the results of examination of frequent specimens of the urine throughout the day in a case of juvenile diabetes. The day urine was sugar-free in spite of considerable carbohydrate ingestion; the night urine contained considerable sugar. This, he was able to show, resulted from exercise, since when the child was allowed to walk no sugar appeared in the day urine, while on the same diet without exercise sugar was constantly present. He believes that it is of considerable importance in the adjustment of the child's metabolism to determine the time of appearance of the sugar, and administer insulin in relation to the requirement in order to avoid hypoglycæmic reactions.

Pulmonary tuberculosis complicating diabetes has been held to be one of the most common, as well as one of the most grave, complications of the condition. M. Labbé has pointed out, however, that, while 35 to 40 per cent of hospital diabetics are stricken with tuberculosis, it is by no means true of private patients, where the ratio is much nearer two cases to twenty diabetics. Others have confirmed these figures. If we divide the diabetics into a benign group and a group with denutrition, we find that tuberculosis is much more common in the latter group. Tuberculosis makes diabetes more severe, and diabetes makes tuberculosis more severe. Tuberculosis seems to flare in the presence of any diabetic accident. Insulin has been said to aggravate the tuberculosis, but L. Bernard² believes this to be erroneous, though it is without any favourable influence on rapidly progressing tuberculosis. For suitable cases of this type he recommends supplementing dietary and insulin treatment with pneumothorax. The use of the gold salts he has found inadvisable. M. Villaret, L. Justin Besançon, and R. Cachera³ have also come to the same conclusion.

Insulin-resistant Diabetics.—H. F. Root⁴ states that no cases of true uncomplicated diabetes in which insulin treatment has been unsuccessful in reducing the sugar of the blood or urine have been demonstrated. There has been great discrepancy of opinion as to the amount of insulin required to classify the patient as resistant. Root suggests that, while the insulin requirement of a totally depancreatized man is unknown, from analogy with dogs, such a person might require from 200 to 300 units daily, and therefore a diabetic patient who requires more than 200 units per day must suffer from some disorder of the

liver muscles or tissue cells in addition to his diabetes. He then groups these conditions as follows: (1) renal glycosuria; (2) complicating disorders of the pituitary, thyroid, or adrenal glands; (3) infections; (4) cardiac complications with decompensation; (5) lesions of the skin; (6) acidosis; (7) cancer, especially pancreatic carcinoma; (8) lack of muscle tone; (9) cirrhosis of the liver; (10) hæmochromatosis; (11) atheromatous cases; (12) disadvantageous combinations of diet and insulin; (13) unexplained cases. Many writers have postulated the existence normally of a co-enzyme whose absence is a possible explanation of the insulin-resistant diabetic, but further work is required to establish the nature of such an enzyme.

Recovery from diabetes mellitus of some standing is of considerable interest. O. Leyton⁵ has published nine cases of recovery from diabetes mellitus, using as a criterion ordinary food for six months without glycosuria. If these patients were diabetic at all—a point on which insufficient data are supplied—it would seem desirable to establish much more rigid criteria of recovery.

Gangrene of the feet in diabetics has been generally attributed to decreased blood-supply due to arteriosclerosis. I. Starr⁶ examined 100 unselected diabetics, using the histamine reaction as described by Lewis: 32 per cent had a normal circulation in their feet; in 34 per cent the circulation was somewhat impaired, and in 34 per cent markedly impaired. The reaction to histamine, in conjunction with the physical findings, permits demonstration of compensatory adaptations and allows clinical detection of pathological change in minute vessels. It is believed that a better prognosis can be made by considering the histamine reaction with the physical findings than by using either exclusively.

Oculomotor Nerve Paralysis in Diabetes.—J. Collier⁷ has seen more than thirty cases of diabetes with ocular paralysis. The onset is painless and not associated with tenderness, and may involve the IIIrd, IVth, or Vth nerve. Recurring paralysis occurred once. Syphilis is not a factor, nor can hæmorrhage or thrombosis be regarded as the cause. The onset is not sufficiently sudden and the recovery under dietetic and insulin treatment too complete to admit of such diagnoses.

PATHOLOGY.

Hæmochromatosis.—W. D. Keith and A. Y. McNair⁸ report a case (with necropsy) of hæmochromatosis and diabetes of nine years' duration associated with primary carcinoma of the liver. Among approximately 130 cases of hæmochromatosis reported up to this time 13, or 10 per cent, have shown a primary carcinoma of the liver. Interesting also, in view of Mallory's production of pigment cirrhosis of the liver by feeding copper acetate, is the excessively high copper content of the liver in this case. H. F. Root⁹ records a case of diabetes showing progressive tendency to require more and more insulin. The patient died in coma though receiving 1600 units per twenty-four hours for the four preceding days. Autopsy showed evidence of marked hæmochromatosis in the liver, heart, etc., but the pancreas was most severely involved. The pancreas consisted largely of fat and fibrous tissue, with hæmosiderin and hæmofuscin pigmentation of acinous, islet, and duct cells, though some islets appeared relatively normal.

Pathological Glycogen Deposits.—Shields Warren¹⁰ has examined by microchemical methods the glycogen content of various organs in normals and diabetics in relation to insulin treatment. Pathologists have considered that the occurrence of glycogen in the epithelium of Henle's loops is one of the most constant signs of diabetes. A diabetic responding satisfactorily to insulin treatment but dying of some condition other than diabetes or sepsis shows

very nearly the same distribution of glycogen as does the normal individual. He suggests the possibility that glycogen in the renal epithelium of a diabetic may represent an attempt at salvage of carbohydrate, and that the susceptibility of diabetics to skin infection may be related to variations in glycogen in the skin. It is interesting to note, however, that A. M. Greenwood and E. M. Rockwood,¹¹ finding that 70 per cent of the feet of diabetic patients show pathogenic fungi and 100 per cent staphylococci, were nevertheless unable to correlate hyperglycemia with these or other infections of the skin.

Blood-cholesterol in normal individuals varies over a considerable range. Thus W. R. Bloor¹² obtained cholesterol values from 190 to 310 mgrm. per cent (average value 236 mgrm. per cent). W. Denis¹³ reports 220 mgrm. per cent as the average normal value, while R. Okey and R. E. Boyden¹⁴ found that the same individual might have 90 mgrm. per cent and at another time 310 mgrm. per cent, and Blix reports similar findings over an extended period. For comparison with abnormal findings it is necessary for each investigator to determine the normal range by the method he employs. European methods on the whole give lower values than those commonly employed in America. In forty healthy individuals H. M. Hunt¹⁵ finds values ranging from 118 to 272 mgrm. per cent. She confirms the finding of Bloor, in pre-insulin days, that cholesterol values in diabetics parallel lecithin and fatty-acid content of the blood. There is a distinct improvement in the cholesterol values in the patient using insulin when compared with the severe diabetic of the pre-insulin era. Neither duration of the disease nor age seems to have much influence on the average blood-cholesterol, nor does it appear that arteriosclerosis goes hand in hand with cholesterol values. Severe cases may have low cholesterol values, and mild cases high values. In a study of cholesterol values in children P. White and H. M. Hunt¹⁶ find that excess blood-cholesterol in uncomplicated juvenile diabetics is an exception and, as in adults, bears no relation to the blood-sugar. The age group 15 to 19 years shows higher values than others. Overfeeding is accompanied by increase in the blood-cholesterol, while departures in either direction from normal weight were associated with increase in blood-cholesterol. There is some evidence that blood-cholesterol in children varies with severity of diabetes.

DIABETIC COMA.

Coma is still too frequent. R. Fitz writes¹⁷: "Nowadays no honest doctor can camouflage a fatal case of diabetic coma as representing the natural culmination of the disease, nor believe with a clear conscience that fatal diabetic coma is ever a justifiable or inevitable catastrophe." E. P. Joslin says¹⁸: "Seven years have gone by since the discovery of insulin, and the medical profession has been taught that insulin cures coma unless the patient is moribund." G. Boyd remarks¹⁹: "Insulin provides a specific form of treatment for [diabetic] coma, which will cure in nearly 100 per cent of cases when it is recognized that coma is an emergency and must be treated as such." Nevertheless, the larger proportion of patients dying of diabetic coma do not receive insulin. The reviewer has remarked on a previous occasion²⁰: Save for infection, coma is due to carelessness, usually on the part of the patient. All the acidosis cases can be improved; not all coma cases can be cured. The loss of one hour is inexcusable delay. Coma is best treated in hospital, but most cases could be saved by an initial dose of 60 units of insulin on diagnosis. The most common reason for failing to use insulin early is fear of that potent drug, insulin, which brings patients out of one kind of coma and plunges them into another—hypoglycemia. This fear is practically groundless, and completely so if sugar is given the patient at

the same time. In point of fact, the high blood-sugar will always take care of the first dose of insulin. When it is realized with what great safety insulin may be given to diabetics, and that almost any abnormality in a diabetic may lead to coma, insulin may sometimes be given unnecessarily; but that will do no harm. Coma can be treated best in hospital, but coma can be abolished by the practitioner. Early treatment is essential. The next essential is sufficient dosage of insulin. Timidity again enters. Diabetics with coma die in hospital to-day, but not of coma: they die of circulatory failure caused by pottering around too long, giving ineffective doses of insulin, or no insulin and 'expectant' treatment. Though lesser amounts suffice for acidosis, a minimum of 200 units is required to cure coma, and one should have no hesitation in administering a goodly portion of this as an initial dose.

While insulin is necessary treatment, other methods of treatment are also of value. The necessity for rest in bed, warmth, fluids with some carbohydrate, and nursing care is obvious. Circulatory stimulants may be required. An enema may be necessary. Washing out the stomach is sometimes useful, but should never be attempted if the circulation is poor. R. D. Lawrence²¹ has again called attention to the need for large amounts of fluids intravenously in these dehydrated patients. He recommends some double-strength **Saline** and gives **Acacia Solution** in addition to normal saline. E. C. Dodds and J. D. Robertson²² emphasize the fact that ketosis and acidosis do not appear to be the sole essential cause of diabetic coma, and, further, that in the fatal cases death is preceded by a persistently falling blood-pressure, indicating the importance of circulatory failure in this condition.

As I. M. Rabinowitch²³ points out, in diabetic coma traces of albumin and showers of casts are almost constantly found in the urine. Complete anuria and retention of non-protein nitrogen in the blood are not uncommon, possibly inducing a uræmic syndrome, but a grave prognosis is not necessarily indicated. He agrees with Joslin's suggestion that the chief cause of this condition is probably damage to the renal cells by the acetone bodies. While, no doubt, this may be an important factor, the factor of dehydration itself should not be overlooked, and, as A. F. Coburn²⁴ points out, the use of intravenous fluids is important in increasing the output of the acetone bodies in the urine.

The use of **Glucose** intravenously with the insulin, as a means of converting the metabolism to a carbohydrate type, is supported by Boyd.¹⁹ Joslin gives carbohydrate by mouth, and administers fluids intravenously very slowly to avoid overdistension of the heart. I. I. Lemann²⁵ reports a considerable number of cases of diabetic acidosis [how many were actually in coma it is difficult to say] in which no alkali was used. In his opinion alkali is not necessary.

DYSINSULINISM AND HYPERINSULINISM. (*See also* ENDOCRINE TUMOURS.)

Spontaneous hypoglycæmia in diabetic patients has often been noted, and certain asthenic patients tend to show low blood-sugar levels preceding their meals. The condition also develops in connection with certain liver disturbances. The introduction of insulin has made us more familiar with the state which may, in some respects, be regarded as the antithesis of the diabetic state. One might, therefore, have expected to find, following the analogy of the pathology of other ductless glands, tumours or other hyperplastic disorders of the islands of Langerhans. The pathological literature is, on this point, however, very meagre, Shields Warren,²⁶ in the most recent paper, having brought the total number of tumours discovered post mortem up to twenty cases. Clinical observation of this condition was first reported by R. M. Wilder, F. N. Allan, M. H. Power, and H. E. Robertson²⁷ in a very complete study

of a case. Twenty months before his death a physician noted sudden attacks of weakness, faintness, and paræsthesia, with both profuse sweating and trembling. Prevention or cure of the condition could be accomplished by eating frequently or taking sweet drinks. Later it became necessary to watch him while asleep and give him candy when there was any unusual behaviour. A metabolic study of his case was made and an exploratory operation was performed, which revealed a tumour mass in the pancreas with metastases in the liver. Post-mortem examination one month later showed metastases in both liver and lymph-nodes, while a considerable portion of the pancreas was replaced by a carcinoma of the islet-cell type. Insulin was recovered from one of the liver metastases.

The patient reported by W. U. McClenahan and G. W. Norris²⁸ had periods of unconsciousness and loss of memory. Admitted to hospital in coma, his blood-sugar was found to be 0.040 per cent and remained low in spite of glucose until he died. At autopsy an adenoma of the islet cells of the pancreas rich in β cells, with marked hypertrophy of islets in the remainder of the pancreas, was found.

After two and a half years of periodic attacks characterized by somnolence followed by great restlessness and irritability, W. Thalhimer and F. D. Murphy's²⁹ case entered hospital in a stuporous condition unable to answer questions, and remained more or less in this state until her death a month later; convulsions, which had first been noticed a year earlier, became more frequent during her stay in hospital. Hypoglycæmia was reported on three occasions. Apart from a tumour of the islet cells of the pancreas, there were no significant pathological changes revealed by post-mortem examination.

Cure of the condition was effected in G. W. Howland, W. R. Campbell, E. J. Maltby, and W. L. Robinson's case.³⁰ A woman, age 52, had attacks of unconsciousness beginning in 1922 and becoming more frequent and more severe. Her behaviour was that of an intoxicated person, then violent convulsions occurred, in two of which the left arm and leg became paretic and speech became thick and slurring. After the second attack the paresis remained some days, but in and after each subsequent attack the slurring speech was noticed. Incontinence appeared with the more severe attacks. These attacks usually terminated with severe sweating and vomiting, but latterly she often slipped quietly into a comatose state. The blood-sugar during a typical attack was 40 mgrm. per 100 c.c. (0.04 per cent), and the patient recovered promptly with the administration of glucose intravenously. Examination of the blood-sugar gave most erratic results. The patient might be roused from coma by intravenous glucose administration, but might promptly return into unconsciousness if sugar administration was not continued by mouth. On the other hand, the blood-sugar tolerance curve was the so-called typical diabetic curve. Approximately three-quarters of a pound of glucose was required per day to keep the patient out of coma. Because of the erratic behaviour the writers felt that they were probably dealing with a tumour of the islets of Langerhans rather than diffuse insular hyperplasia. Dr. Roscoe Graham removed a tumour of the pancreas, which was found to contain insulin and which consisted of islet cells. Infiltrating characteristics were shown by the absence of a definite delimiting capsule and by the presence of normal pancreatic ducts in the centre of the mass, so we must regard the tumour as a slowly growing carcinoma. An interesting finding was the mixture of alpha and beta granules in the same cell, the beta type being collected close to the capillary blood-supply. This may have determined the character of the granules or may have been an expression of the lack of differentiation. The patient made an uneventful recovery and has remained well for the past twenty months.

Besides the carcinoma reported above, F. N. Allan³¹ reports two further cases of hyperinsulinism inducing a hypoglycæmia, loss of consciousness, and convulsions. As it could not be controlled by medical means, operation was undertaken in one case. The tail and part of the body of the pancreas were resected. The patient has obtained considerable, though not complete, relief. The pancreas appeared normal to gross and microscopic examination. The other case has had similar symptoms, but is still under medical treatment. He is unable to work because exercise appears to increase the hypoglycæmia.

This condition may now be regarded as a definite disease entity, and doubtless an increasing number of cases will be described. Indeed, we have learned of two since the publication of our paper. It would seem probable that we must look to the neurologist to uncover these cases because of the convulsions and unconsciousness, which might be regarded as epilepsy. There is, as Allan points out, another possibility that should not be overlooked—that is, a hypoglycæmia due to hepatic insufficiency, examples of which have been published.

W. H. Nadler and J. A. Wolfer's³² case of hypoglycæmia occurred in a patient in whom a primary liver-cell carcinoma had replaced all but one-fifth of the normal liver tissue. Hyperinsulinism can be ruled out by the absence of insulin in the tumour tissue and a normal quantity in the pancreas, which likewise appeared normal to examination. Though it is remarkable that no other signs of liver deficiency were encountered, the remaining liver tissue was low in glycogen and showed microscopic signs of degeneration.

To these should be added a third possibility—a hypoglycæmia due to hepatic over-efficiency, causing a storage of carbohydrate as glycogen and fat, and leaving the blood and tissues poor in sugar. A differential diagnosis between these various possibilities is by no means easy.

H. Josephs³³ has reported a group of cases in children in which somnolence, coma, ketosis, and convulsions were all associated with hypoglycæmia. In two fatal cases the liver was found to be markedly infiltrated with fat. Hypoglycæmia has been found in phosphorus, chloroform, hydrazine, and white snake-root poisoning, which have a closely similar picture. Josephs ascribes these hypoglycæmic attacks in children to a lability of the blood-sugar, which tends to fall more rapidly than usual during a short period of fasting. The infiltration of the liver with fat recalls the inverse relationship found by J. J. R. Macleod and co-workers between glycogen and fat content of the liver in depancreatized animals under intermittent insulin treatment.

J. M. Nielson and E. L. Eggleston³⁴ report three cases of functional dysinsulinism with epileptiform seizures. These seizures were associated with low blood-sugar and low blood-pressure, but the relationship was not absolutely constant. On treatment by frequent feedings or with suprarenal gland, or both, the epileptiform manifestations have ceased. They call attention to the fact that a single fasting specimen of blood may have a normal sugar content, but a sugar tolerance test yields very low values. With **Epinephrin** therapy there is a rise in the tolerance curve.

A well-nourished boy, age 4, was recently referred to the reviewer because of glycosuria and periodic drowsiness. In December, 1928, he had bronchopneumonia, and during convalescence severe sweating occurred each time he went to sleep. In February, 1929, he was still sweating at night. At Easter he caught cold; sweating became severe but always got better with food. Vomiting occurred with the sweats at this time. Sugar was found in the urine on several occasions, always after a good meal. In September he had drowsy spells with sweats at night. On restricted diet he became weaker and short of breath, but was always better after eating apples. Admitted to hospital in acidosis with drowsiness and vomiting, his blood-sugar was found to be

0.034 per cent, and he recovered promptly on administration of sugar. With low carbohydrate diet the blood-sugar would fall and the usual attack appear, but when high carbohydrate foods were given several times a day he remained symptom-free and his blood-sugar remained normal. In Wilder's case, as in Howland, Campbell, Maltby, and Robinson's case of dysinsulinism, the blood-sugar tolerance test showed a diabetic type of curve. In this boy administration of 1.75 gm. of glucose per kilo. showed a curve which rose promptly, remained high for two hours, and then dropped to the fasting hypoglycæmic level. Presumably, a similar state caused the glycosuria after meals above noted. The acidosis, drowsiness, sweating, and vomiting were caused by the insufficient amount of available glucose. The child's physical condition was not abnormal except for a chronic tonsillitis, a recent flare-up of which has made it at present inadvisable to remove the tonsils. The patient remains well on a high carbohydrate diet, but whether this is a true hyperinsulinism or an alteration in hepatic efficiency is difficult to determine, though for the latter supposition there is no evidence in the clinical examination of the liver. (*See also* ENDOCRINE TUMOURS.)

SURGERY IN DIABETES.

In the last volume of the *ANNUAL* the reviewer was rash enough to indicate his belief in the growing opinion that necessary operations upon patients whose diabetic condition has been adequately corrected with insulin are relatively safe procedures, and that many lives are lost by needless caution in this respect. This is only true under conditions where adequate study of the patient by physician and surgeon in collaboration is possible. A. T. Bazin,³⁵ Professor of Surgery at McGill University, acknowledges the value of this co-operation, and at the same time gives point to the first statement by pointing out that 73 surgical operations were performed on diabetic patients admitted to Montreal General Hospital during 1929, with 2 deaths (mortality ratio 2.74 per cent). Septicæmia from advanced gangrene of the leg and failure to recover following operation for carcinoma of the stomach account for the deaths. Among a total of 5750 operations for the same year, 139, or 2.41 per cent, post-operative deaths occurred. This crude analysis might possibly be modified somewhat were a transfusion and 14 incisions for abscesses, cellulitis, etc., not included, and similar cases deleted from the list of total operations. Nevertheless, the wide range of surgical problems encountered in these diabetics and treated with success may be taken as evidence that the diabetic with surgical complications has to-day a much more reasonable prognosis than he had before insulin. As to choice of anæsthetics in his cases, Bazin used ether and nitrous oxide in about equal numbers of cases; 17 had local anæsthetics only; while 7 were given spinal anæsthesia.

Bazin also records two instructive cases of diabetic patients suffering from symptoms pointing to an abdominal lesion: in the one case due to acidosis, in the other due to acute suppurative appendicitis. He says that the diagnosis may only be made by refinement of analysis of symptoms and their significance. With an acute abdominal lesion there may or may not be fever; there are pain, vomiting, and leucocytosis, and the pain precedes the vomiting. In the diabetic with acidosis there may be fever, usually leucocytosis, pain, and vomiting, but vomiting precedes the pain; the signs elicited on abdominal examination are diffuse and indefinite, while the general disturbance is disproportionate to the abdominal findings. It is our misfortune that, while this is true in general, the practitioner's problem is always the individual, and in the individual patient the differentiation is not always clear-cut. Bazin recognizes this when he states that it is safer to operate on a diabetic and

find nothing than to withhold operation from an acute abdominal lesion just because it happens to attack a diabetic. The problem of differential diagnosis in these cases is not an uncommon one. It may be suggested that, in any event, acidosis must be treated. Immediate intravenous injection of 100 units of insulin is useful, and may produce rapid subsidence of the pain and quasi-voluntary abdominal rigidity, if acidosis is the sole cause of the symptoms, sometimes before the arrival of assistance. No fear need be entertained of a hypoglycæmia from such large dosage, since glucose administration, intravenously if necessary, will control this possibility.

Carbuncle.—D. J. MacMyn³⁶ suggests that the association of carbuncle with diabetes has perhaps been overestimated. In a series of 470 patients with diabetes there were 19 carbuncles. These occurred in patients of 46 to 76 years with one exception, and in half the cases the diabetes was mild. Eight of these 19 patients came to hospital for treatment of carbuncle, and diabetes was discovered. In no cases did carbuncles recur after initiating dietetic or insulin treatment. In 100 consecutive cases of carbuncles glycosuria was found six times, but only two of these were diabetic, the rest being temporary glycosurias. The series presents an unusually low mortality, but one death being recorded. [In the reviewer's experience staphylococcus septicæmia in diabetic cases with carbuncle has not been infrequent.—W. R. C.]

MacMyn recommends gas anæsthesia, deep wide cruciate incisions, removal of the maximum amount of necrotic tissue, control of hæmorrhage by pressure, gauze packing, or occasionally understitching, cauterizing with pure phenol, packing with double cyanide gauze, and abundant dressing. Light meals, calomel, fluids, a saline, and an iron tonic are prescribed. The wound is irrigated with saline and packed with Morison's magnesium sulphate and glycerin paste if the cavity is large or sloughing. Later, esol dressings are used; cleansing the surrounding area at each dressing with ether to prevent infection of surrounding hair follicles is recommended. The results from the use of Morison's paste are indeed remarkable; the first dressings with it, however, are sometimes so exceedingly painful that one would recommend morphinizing the patient beforehand. Smearing the surrounding area with one-quarter strength ung. hydrarg. ammoniati at each dressing would also seem useful in limiting hair-follicle infection.

Operative Treatment of Diabetes.—G. de Takáts³⁷ has found in dogs that separation of the tail of the pancreas from the rest of the gland leads to development of islets of unusual size with mitotic figures and an increased tolerance for dextrose. The question arose whether hypertrophy of the islets and increased function could be brought about in human diabetes. In one of R. M. Wilder's³⁷ cases, for which little might be hoped by medical management, the situation was fully explained and the matter put to trial. Three centimetres of the tail of the pancreas was separated by electrocautery from the body of the gland and wrapped in omentum. From the immediate effects of operation the patient recovered well, but retained pancreatic juice and an abscess necessitated two further operations. The subsequent course was one of improvement. The wounds healed; the insulin requirement fell 10 units below the level previous to operation, and the patient was able to use a diet containing 46 grm. more glucose. These results are encouraging, but the reviewer understands that little further improvement has taken place. In this patient the anatomical relationships made it impossible to isolate a very large portion of the gland, and it is possible that better results might have followed isolation of a larger portion. Only years of observation will yield the information necessary to evaluate this procedure.

Post-operative Treatment.—Because of the known value of intravenous

injection of glucose solution in non-diabetic post-operative cases, H. John³⁸ has adopted the procedure in his diabetic surgical patients with good effect. To each 250 c.c. of 10 per cent glucose solution he adds 20 to 50 units of insulin, depending on the severity of the diabetes and the height of the blood-sugar at the time. In the reviewer's opinion the post-operative patient benefits most from a large infusion begun early, continued slowly and for a long period. The Murphy drip apparatus may be used, being adjusted for delivering 30 to 45 drops per minute; the needle is inserted in the vein in the usual way, the tubing then being strapped to the arm and the wrist tied loosely to the bed-rail to prevent its unintentional movement. At the slow rate infusion may be continued for hours or even days. No heating of the sterilized glucose solution is required, and if a good grade of glucose is employed no chills are ever encountered. The heat deficit is negligible.

TREATMENT.

Insulin by Mouth.—R. Stephan³⁹ stated that, under conditions where the stomach was free from ferments and exceptional absorptive capacity of the gastric mucosa was present, lipoid suspensions of dry insulin were absorbed, but only if a bile reflux took place. This led him to develop a bile-acid combination with insulin which, he states, lowers the blood-sugar and improves the metabolism of the patient for a considerable time and may lead to healing of diabetes. M. Ottow⁴⁰ reports two cases of juvenile diabetes of short duration which, she believes, were favourably influenced by Stephan's preparation. A. Bratusch-Marrain⁴¹ states that the expectations were not borne out. A. W. Elmer and M. Schepps⁴² could find no blood-sugar-lowering effect of the bile-acid insulin combination and regard it as unsuitable for treatment. P. Martin and W. Nagel,⁴³ and V. van der Reis and G. Schlomka⁴⁴ obtained comparatively negative results. J. Mouzon,⁴⁵ in a critical discussion, sums up the question: "At present there is no other way of therapeutic administration of insulin but the needle."

Alcohol in Treatment.—T. C. Hunt⁴⁶ notes that alcohol possesses an anti-ketogenic value in diabetes. Temporary lowering of the blood-sugar is found in Hunt's cases, though others have found, with excess caloric diet, that the blood-sugar rises and glycosuria and acidosis increase. Rectal administration of the alcohol also gives a fall in blood-sugar. When alcohol is given by mouth with sugar, the rise in blood-sugar is somewhat more rapid than when sugar alone is given, but the level of blood-sugar attained is little affected. Hunt suggests that alcohol is useful as a mental sedative in patients undergoing partial or complete starvation, that it is an aid to appetite and makes one-sided diabetic diets more palatable, and that it is useful in diabetic coma.

Toast versus Bread.—R. D. Lawrence,⁴⁷ investigating the hyperglycaemic effect of bread and toast when given to diabetics, found no essential difference when the carbohydrate content was the same. From his data one may reasonably infer that weight for weight toast is worse tolerated than bread because it contains more carbohydrate.

Uncooked Starches.—S. M. Rosenthal and E. E. Ziegler⁴⁸ have found that administration of uncooked starches to normal animals causes rise in the blood-sugar of several hours' duration. In normal persons no rise in blood-sugar occurs; when fed to diabetics the effect on the blood-sugar is almost negligible. Cooked starches, on the other hand, materially increase the blood-sugar of normal individuals. The liberation of absorbable sugars from the uncooked starch is probably slow. The use of these raw starches, or foods which contain them, is being investigated with the hope of obviating the need for insulin in diabetics of mild or moderate severity.

Insulin in Non-diabetics.—Insulin has been much used by W. Falta and others as a means of fattening emaciated asthenic individuals. In a recent paper, V. Calvo⁴⁹ reports favourable results in undernourished convalescents from various diseases by this treatment. The daily output of urine diminishes, and with it there is a decrease in the chloride output and increase in the alkali reserve of the blood, suggesting increased tissue fixation of water. A transitory hypoglycæmia occurs with stimulation of appetite; the body weight rises in association with the increased intake of food. Falta⁵⁰ goes much farther. Without minimizing other factors, he believes that there is a definite relationship between excessive insulin production and obesity, and the fattening cure by insulin is dependent upon: (1) An increased demand for food; (2) An improvement in the nutritive condition, causing an increased desire to eat; (3) Training of the insulin-producing organ by carbohydrate administration to produce more insulin.

NOXIOUS SIDE-EFFECTS OF INSULIN.

Sensitization to Insulin.—P. Bonem⁵¹ describes a case of hypersensitivity to insulin of marked severity appearing as an urticaria ten days after the first administration of insulin and becoming more marked with each injection, especially in the region of the injection. On this account another preparation of insulin was tried; five minutes after the injection a most alarming collapse occurred with thready pulse, marked pallor, œdema of the mouth and tongue mucosa, glottis œdema, audible inspiratory stridor, salivation, and inability to swallow. The response to intravenous **Calcium** was good. Various foods—fungi, crabs, strawberries, shell-fish—were tried, but caused no untoward symptoms. Intracutaneous injection of $\frac{1}{10}$ c.c. of insulin gave a typical immediate local hypersensitive response, lasting half an hour, without general symptoms. Salt solution injected as control showed no response. Gradual desensitization was accomplished by slightly increasing the dose of the original brand of insulin each day. At 15 units a Quincke's œdema appeared around the eyes, but was controlled by oral administration of calcium. Later, other brands of insulin were tried out and were also well borne.

This patient evidently sensitized herself to the insulin preparation and then became desensitized under treatment. From the evidence available one cannot state whether she was sensitive to insulin itself, as in some cases reported by the reviewer, or whether she was sensitive to traces of protein characteristic of the animal from which the insulin was derived. In such cases the simplest plan is to change from beef insulin to pork or sheep insulin. If crystalline insulin produces the characteristic urticaria, however, the only resource is desensitization. **Epinephrin** is useful in controlling the symptoms of sensitization.

Hæmaturia.—One of the rarest complications of insulin treatment is the occurrence of hæmaturia. According to D. M. Stern,⁵² who reports two cases, only twelve cases are known to have occurred, and some of these cannot be unconditionally accepted. The hæmaturia is transient; it may be considerable, without subjective symptoms as a rule; there is usually but one attack, and this accompanied by ketosis and occurring late after the injection of the insulin, always in young patients—usually males. Stern suggests that it is related to the ketosis, but, as all uncomplicated cases recovered, it does not affect the prognosis or treatment of diabetes mellitus.

FRUCTOSURIA.

P. A. Heeres and H. Vos⁵³ report a new case of fructosuria. About fifteen cases of true fructosuria have been reported, only two at all completely. The

presence of fructose in the urine after its administration by mouth has been employed as a test for liver efficiency in diseases involving that organ. It is also excreted by severe diabetics after administration of levulose or sucrose. In true fructosuria the levulose appears in the urine only on administration of the sugar or other carbohydrates, which are broken down to form levulose. In the case described there is no evidence of liver disease, nor is the glucose-tolerance test abnormal. When 50 grm. of fructose were administered by mouth a significant rise in the blood-sugar took place with excretion of pure fructose for five and a half hours. Fructose was found in the blood during this test. In contrast to Barrenscheen's⁵¹ case, there apparently is no threshold for fructose in this patient, but the total amount excreted was only 12 per cent of that administered. This percentage corresponds to the results in other cases, and remains constant regardless of the amount administered. Fructose was not excreted after administration of inulin. Sorbose, another ketohexose, is excreted to the amount of 76 per cent of the ingested amount. Dihydroxyacetone, a ketotriose, on the other hand, was not excreted. No material rise in the respiratory quotient took place after administration of fructose, which, the authors argue, points to a lack of combustion of the sugar. Fresh solutions of fructose injected into the vein, or crystalline fructose per rectum, produces greater fructosuria than fructose given by mouth—a point that leads to the suggestion that the fructosuria is associated with only one of the forms of fructose.

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DIARRHŒA, SUMMER. (See EPIDEMIC ENTERITIS.)

DIATHERMY. (See also CONJUNCTIVA, DISEASES OF.)

C. Thurstan Holland, F.R.C.S.

Puerperal Septicæmia and Pneumonia.—C. A. Robinson's¹ paper on the diathermy treatment of puerperal septicæmia and pneumonia is one deserving of careful consideration, inasmuch as the author sets himself a very high standard in a series of postulates with which the paper begins. He describes with full details twenty-one cases of puerperal septicæmia treated by diathermy at the West Middlesex Hospital, and concludes that without the intervention of diathermy most of them would have died, whereas there were only three deaths in the series. This treatment has been used in eighty-nine cases of lobar pneumonia, but the results do not justify the author in saying that his

postulates have been satisfied, although the results appear to show that this method has many advantages. This paper is written with great restraint, and is all the more useful on this account. The methods used are explained, and considerable use is made of temperature charts.

Anal Fissure.—The treatment of this very painful condition by diathermy is advocated by F. Howitt² in a paper in which reference is made to previous reports. The new point is that the advent of modern diathermy apparatus has made possible a greater and more sustained production of local heat. The author, from his own experience, has no doubt of the curative value of this method of treatment, and expresses surprise that it has been so little employed in this country. He uses it in both acute and chronic cases. The technique is very carefully explained.

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DIPHTHERIA.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—The seventh annual summary, by the *Journal of the American Medical Association*,¹ of diphtheria mortality in the eighty-one cities of the United States with a population of more than 100,000 shows that the relatively high wave of diphtheria prevalence on the Pacific Coast and in the Mountain States has now receded, this group having the worst rate of any geographic division in 1929. Moreover, the actual number of diphtheria deaths reported in 1929—2698 for eighty-one cities—is considerably lower than for many years. (See MEDICAL ANNUAL, 1928, p. 113; 1929, p. 129.)

According to the *Bulletin* of the Swiss Health Service,² although diphtheria is not such a serious disease in Switzerland as it used to be, it still holds an important place among infectious diseases. Its incidence was high in 1920, when 8346 cases were notified, but subsequently showed a decline until 1926, when there were only 1930 notifications. In 1927, however, the number rose to 2398, in 1928 to 3193, and to 3220 in 1929 (up to the end of November). The number of fatal cases has followed a similar course, falling from 674 in 1920 to 115 in 1926, and then rising to 151 in 1927, 200 in 1928, and 134 for the first nine months of 1929. The number of notifications undoubtedly underestimates the true incidence of the disease, but the number of deaths may be regarded as fairly accurate.

W. Silberschmidt³ gives a table of the diphtheria notifications and deaths in Switzerland during the period 1918–28, indicating that, unlike typhoid fever, diphtheria does not show a constant decline, but that the morbidity and mortality present considerable oscillations, periods of low incidence and mortality being followed by periods of high incidence and mortality.

M. Mann and I. J. Kligler⁴ illustrate the low prevalence of diphtheria in Palestine generally and in Jerusalem in particular by the fact that in the period 1923–7 the total number of cases in Palestine annually ranged from 21 to 151 only and the death-rate from 0.14 to 1.50 per 100,000 inhabitants, while in Jerusalem during the same period the total number of cases ranged from 9 to 36 annually and the death-rate per 100,000 from 0 to 8.4. Diphtheria, therefore, like scarlet fever, is far less prevalent in Palestine than in countries with a temperate climate.

SYMPTOMS AND COMPLICATIONS.—E. B. Shaw and H. E. Thelander⁵ investigated the *causes of severity* in a series of 100 cases of severe diphtheria and found them to be as follows: (1) Unusual virulence and malignant course, 6 cases only. (2) Delayed diagnosis, 92 cases, in 41 of which the patients were responsible, and in 51 the doctor, who mistook the condition for simple or suppurative tonsillitis, laryngitis, or asthma. In 12 of the cases diphtheria

complicating some other medical or surgical condition was missed because too much attention was paid to the primary condition and the possibility of intercurrent diphtheria was overlooked until the disease was far advanced. (3) Inadequate treatment. In only two cases was too small a dose of antitoxin responsible for the severity of the attack.

A. L. Hoyne and A. J. Levy⁶ illustrate the rarity of *diphtheria of the penis*, of which they record an example in a boy of 7, by the fact that it was the first case of the kind among 14,000 diphtheria patients treated at the Municipal Contagious Diseases Hospital, Chicago, since its opening in 1917. Diphtheria of the penis is usually secondary to some other diphtheritic lesion, though a few cases of primary infection of the genitals have been recorded, e.g., by Cochrane (see MEDICAL ANNUAL, 1922, p. 106). The present case is the first on record to occur in a circumcised person and not due to circumcision, which had taken place in infancy. The penile lesion was associated with severe faucial and nasal diphtheria. Recovery followed large doses of antitoxin.

A. H. G. Burton and A. R. Balmain⁷ illustrate the rarity of *foreign bodies in the nares producing a carrier condition* by the fact that there were only 3 such cases among a series of 1968 diphtheria patients admitted to the Ilford Isolation Hospital. In one of the cases in which the Schick test was performed the result was negative, so that the question arises as to whether this was due to his having immunized himself by infecting the nose with diphtheria bacilli from the foreign body and so administered to himself small doses of toxin.

C. Farmakidis,⁸ who records 7 cases of *agranulocytosis* in diphtheria in patients aged from 7 months to 35 years, states that systematic examination of the blood of his diphtheria patients revealed a number of cases with the characteristic features of agranulocytosis—namely, very marked leucopenia with almost complete disappearance of the polymorphonuclears and increase in the number of blood-platelets, but no important changes in the number and quality of the red cells. All but one of the patients recovered.

As the result of experiments on rabbits injected with diphtheria toxin and clinical observations on diphtheria patients, F. F. Schwentker and W. W. Noel⁹ came to the conclusion that there is a marked abnormality in the *carbohydrate metabolism* in diphtheria intoxication, being probably due to a suppression of the production of insulin with a resultant hyperglycæmia. The liver and muscles show a pronounced diminution in glycogen in all cases.

In a paper on *tracheotomy and tuberculosis*, J. D. Rolleston¹⁰ alludes to Landouzy's statement that children who had undergone tracheotomy for laryngeal diphtheria were specially susceptible to tuberculosis and very few reached adult life. This view, which was based on the rarity with which Landouzy had found tracheotomy scars among recruits, was severely criticized by subsequent writers as regards tracheotomy being a predisposing cause of tuberculosis, though several were inclined to regard it as responsible for chronic tonsillitis and respiratory infections. Rolleston records a case of tracheotomy for laryngeal diphtheria in mother and child, the former having been operated on in 1896 at the age of 2 years, and the latter in 1928 at the age of 4. Since her operation in 1896 the mother had enjoyed good health and had not had any respiratory affection except during the influenza epidemic of 1918, when she lost her voice for two months. An almost identical case of a mother tracheotomized at the age of 3½ years and a daughter at the age of 2 is also recorded by Rolleston,¹¹ who had seen several other adults who had undergone tracheotomy for laryngeal diphtheria in childhood but had not developed any obvious signs of tuberculosis since, so that his experience agrees with that of Landouzy's opponents.

Examples of *spontaneous recovery from diphtheria* are recorded by F. Hamburger and J. Siegl,¹² who state that during the last five years 20 cases of mild faucial or nasal diphtheria in which the clinical diagnosis was confirmed by bacteriological examination have been treated at the Graz University Children's Clinic without antitoxin. All made an uncomplicated recovery with the exception of a child in whom the nature of the sore throat had not been recognized during the acute attack and paralysis developed in convalescence. Of the 20 cases 15 were Schick-positive after recovery. In the only case in which an estimate of the antitoxin in the blood was made, it was found to be less than 0.0004 per c.c. The writers conclude that in a large number of cases of spontaneous recovery from diphtheria free antitoxin is not to be found in the blood, and that therefore in addition to antitoxin other antibodies must be responsible for recovery from the disease.

SCHICK TEST.—B. Schick and A. Topper¹³ report on 100 children, aged from 2 to 12 years, who gave a positive Schick reaction before tonsillectomy. Six months after the operation they were re-tested, and 82 were then found to be negative and only 18 positive. Such a high rate of immunity does not usually develop until adult life, and the following explanations are offered to account for it: (1) During the six months after tonsillectomy a certain proportion, but not more than 5 to 10 per cent, would have developed immunity even without tonsillectomy. (2) A certain percentage of the children may have been carriers of diphtheria bacilli. After tonsillectomy they may have developed a mild auto-infection and so acquired immunity. This would account for only a small increase in the negative reactions. (3) The children living in congested districts may have been exposed to diphtheria immediately after tonsillectomy, and so may have acquired a mild infection which stimulated production of diphtheria antitoxin. (4) The minute doses of toxin in the Schick test may have stimulated the cells to produce antitoxin. (5) Infections other than diphtheria not only produce their specific antibodies, but also increase the production of other antibodies.

The practical conclusions to be drawn are: (1) Tonsillectomy should be performed in preference to immunization in children with diseased tonsils who are sensitive to horse serum; (2) Children who have had tonsillectomy performed six months or more previously should be Schick-tested before being immunized with toxin-antitoxin.

While agreeing with Friedberger and Heim (*see* MEDICAL ANNUAL, 1930, p. 163) that the skin of the newborn shows a peculiar lack of reaction to various stimuli, F. von Groer¹⁴ maintains that 84 to 85 per cent of all newborn children have antitoxin in their blood and therefore give a negative Schick reaction. In the remaining 15 to 16 per cent the reaction varies, being positive in some and negative in others.

F. K. Kleine and H. Kroo¹⁵ state that of 101 East African natives (95 children and 6 adults) on whom the Schick test was performed, not a single one gave a positive result. The antitoxin content of the blood was examined, and found to be high in all. These results are very surprising in view of the fact that diphtheria is a completely unknown disease in the tropics. Similar observations were made by Bay-Schmitt among the Eskimos (*see* MEDICAL ANNUAL, 1930, p. 161).

The occurrence of a negative phase following the small doses of diphtheria toxin in a Schick test is emphasized by J. Siegl,^{16, 17} who records two cases in infants of 4 and 8 months respectively who developed nasal diphtheria as the result of the disappearance of antitoxin in their blood following a Schick test.

DIAGNOSIS.—D. M. Tolle¹⁸ states that out of 344 cases of croup admitted to the Willard Parker Hospital, New York, only 212 (61.6 per cent) were due to

diphtheria. The routine procedure in each case consisted of direct laryngoscopy, examination of cultures from the larynx, nose, and throat, and the usual physical examination.

PROPHYLAXIS.—From observations on 60 school-children of from 6 to 9 years G. Tron¹⁹ found that it was possible to produce active immunity to diphtheria in susceptible subjects after a comparatively small number of nasal insufflations (six) of concentrated and glycerinated anatoxin without any bad effects.

On the other hand U. Ferri,²⁰ who reports his experience of intranasal inoculation of anatoxin in 178 children aged from 4 months to 15 years, agrees with Zoeller (*see* MEDICAL ANNUAL, 1928, p. 117) that the method is not suitable for general use, as it involves a waste of anatoxin and a considerable number of applications.

H. Baar and A. Grabenhofer²¹ report their experience of *percutaneous immunization* with Löwenstein's preparations, which were in the form of an ointment or an inspissated syrup (*see* MEDICAL ANNUAL, 1930, p. 165). Guinea-pigs on which the method was applied showed no reaction to minimal lethal doses of diphtheria toxin or intraconjunctival injection of virulent diphtheria bacilli, whereas control animals developed typical ocular diphtheria with destruction of the cornea and atrophy of the eyeball. Of the children who underwent percutaneous immunization 50 to 60 per cent became Schick-negative in six weeks, and 70 to 75 per cent within four months.

The occurrence of *diphtheria after active immunization* has recently received considerable attention from French physicians, such as P. Lereboullet and J. J. Gournay,²² B. Weill-Hallé, Gorostidi, Delteil, and Papayanou,²³ and J. Lardier.²⁴ Lereboullet and Gournay maintain that probably the majority of those supposed to have been properly inoculated were not really so, and that the incidence of diphtheria among those inoculated with antitoxin is very small if the following cases are excluded: (1) Persons who have been given only one or two injections instead of three; (2) Cases in which there had not been the proper interval of three weeks between the first and second injection, and of a fortnight between the second and third; (3) Those in which diphtheria developed in less than two months after the last injection; and (4) Those in which the inoculation was not properly performed.

Lardier²⁴ maintains that the prognosis of faucial diphtheria in the immunized is about the same as in those who have not been immunized, severe and complicated cases occurring in about a third of those who have been immunized. According to Weill-Hallé²³ the diphtheria mortality among those who have been inoculated with anatoxin is not more than 1 per cent.

A. Bessemans²⁵ records two deaths in boys of 14 and 5 respectively during a course of active immunization against diphtheria. In both cases, however, death was due to diphtheritic toxæmia, diphtheria toxin having been given in mistake for toxin-antitoxin in the first case and for anatoxin in the second in doses of 1 c.c. and $\frac{1}{2}$ c.c. respectively.

TREATMENT.—In cases of severe toxæmia and circulatory failure, F. F. Schwentker and W. W. Noel²⁶ give a large dose of **Antitoxin** on admission to hospital. If no reaction has occurred within half an hour, 10,000 to 20,000 more units of antitoxin and 20 gm. of a 50 per cent solution of **Dextrose** are injected intravenously and 10 to 20 units of **Insulin** intramuscularly. Sedatives are given if the patient is restless. Intravenous injection of dextrose is repeated at intervals varying from twelve to twenty-four hours in each case accompanied by insulin. After one or two injections the dextrose may be given in 10 per cent solution. The injections of dextrose and insulin are continued until recovery seems certain. Of 14 toxic cases so treated, 13 recovered.

According to D. M. Tolle¹⁸ the usual treatment for laryngeal diphtheria at the Willard Parker Hospital is to give antitoxin intravenously, to remove the membrane from the larynx, trachea, and bronchi by suction, and to employ intubation as a last resort. The indications for **Laryngeal Suction**, which is carried out by direct laryngoscopy, metal tubes, and a motor-driven pump, are the same as those for intubation. In Tolle's cases the number of suction ranged from one to eight, but the majority required only one. The average time between suction was six hours. The advantages claimed for suction are : (1) Complete relief from dyspnoea in most cases, necessitating fewer intubations ; (2) Less frequent incidence of bronchopneumonia ; (3) Lower mortality ; (4) In cases which come to intubation previous suction prevents blocking of the tube because all loose membrane and mucus have been removed ; (5) Relief from alarming symptoms in many cases of tracheo-bronchial diphtheria.

M. Lisbonne, P. Devèze, and Labraque-Bordenave²⁷ successfully treated 14 diphtheria carriers by insufflation once or twice daily of a powder consisting of 1 to 2 grm. of the neutral **Sulphate of Oxyquinoline** in 100 grm. of **Bismuth Carbonate**.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, xciv, 1838 ; ²*Bull. Eidgen. Gesundh.* 1930, 21 ; ³*Schweiz. med. Woch.* 1930, 309 ; ⁴*Jour. of Prev. Med.* 1929, 309 ; ⁵*Arch. of Pediatrics*, 1930, 178 ; ⁶*Jour. Amer. Med. Assoc.* 1930, xciv, 1395 ; ⁷*Lancet*, 1929, ii, 977 ; ⁸*Presse méd.* 1929, 1121 ; ⁹*Bull. Johns Hopkins Hosp.* 1930, xvi, 259 ; ¹⁰*Brit. Jour. Child. Dis.* 1929, 200 ; ¹¹*Proc. Roy. Soc. Med.* 1930, xxiii, 271 ; ¹²*Munch. med. Woch.* 1929, 1537 ; ¹³*Amer. Jour. Dis. Child.* 1929, xxxviii, 929 ; ¹⁴*Deut. med. Woch.* 1929, 1046 ; ¹⁵*Ibid.* 1930, 46 ; ¹⁶*Arch. f. Kinderheilk.* 1929, lxxxviii, 95 ; ¹⁷*Munch. med. Woch.* 1929, 1632 ; ¹⁸*Amer. Jour. Dis. Child.* 1930, xxxix, 954 ; ¹⁹*Rev. d. Hyg.* 1930, 259 ; ²⁰*Policlinico* (Sez. Med.), 1929, 592 ; ²¹*Zeits. f. Kinderheilk.* 1929, xlviii, 248 ; ²²*Paris méd.* 1929, ii, 579 ; ²³*Bull. Soc. de Péd. de Paris*, 1929, 431 ; ²⁴*Thèse de Paris*, 1930, No. 22 ; ²⁵*Rev. Belg. Sci. méd.* 1929, 597 ; ²⁶*Bull. Johns Hopkins Hosp.* 1930, xvi, 358 ; ²⁷*Paris méd.* 1930, i, 234.

DIVERTICULITIS. (See also COLON, SURGERY OF ; X-RAY DIAGNOSIS.)

Robert Hutchison, M.D., F.R.C.P.

E. I. Spriggs¹ considers that this disease is not so rare as has been supposed. There are three stages in its development :—

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|---|-------------------|
| 1. The prediverticular state | } Diverticulosis. |
| 2. The stage of formed diverticula | |
| 3. The stage of inflamed diverticula or diverticulitis. | |

1. The first of these can be recognized by the X rays. The part of the bowel affected loses its normal segmentation and presents a more rigid outline with small convexities upon it. In many cases no symptoms are complained of at this stage, but if a large area is affected, as sometimes happens, then pain or burning discomfort is felt.

2. The second stage of formed diverticula is often found at radiological examinations (in 10 per cent of 1000 consecutive cases at Ruthin Castle). The etiology is not understood. It is commonest in middle age, more frequent in men than in women, and constipation does not appear to play a part (contrary to what is often taught). It may be quiescent, but in about half the cases some abdominal discomfort and irregularity of the bowels are complained of and there may be painful or frequent micturition, headache, malaise, and nausea. There is often a disposition to the lumbago associated with spondylitis.

3. When inflammation of the pouches (diverticulitis) has supervened the clinical features are those of a low form of inflammation in the large bowel, usually in the left lower quadrant of the abdomen, spreading to neighbouring structures. Abdominal discomfort, less often pain, not as a rule related to

food, is situated about or below the navel, but especially in the left iliac fossa. It may be intermittent, with intervals of several weeks or longer. The pain can be severe, and is often accompanied by a feeling of ill health; it may take the form of a dragging sensation and backache. Flatulence and a feeling of distension are usually mentioned, and may be the only symptoms; an advanced state of diverticulitis may, indeed, be present with but little complaint; in several there is no pain. Constipation, irregularity of the bowels, diarrhoea, or a sense of incomplete evacuation is frequent. The increasing constriction leads slowly, usually very slowly, to obstruction.

In cases of implication of the bladder there may be frequent micturition, sometimes painful, after the bowels are opened; or a painless micturition may be followed by pain in the tumour. This symptom may be due to adhesion of the inflamed gut to the bladder, but it is complained of in cases in which radiological evidence of adhesion cannot be made out.

A sausage-shaped tumour, sometimes tender, but not always, can be felt in the left iliac fossa or below the brim of the pelvis, except in the very obese. It may become acutely inflamed, with pyrexia and vomiting. The tumour often varies, in the earlier stages, in size and hardness. Diverticulitis sometimes occurs at other parts of the colon. Swellings appearing later as a result of abscess will vary in form according to the extent and site of the secondary inflammation. Hæmorrhage per rectum, excluding that from piles, may occur, but it is not usual, the inflammatory lesion lying as a rule without the mucous membrane; the disease is, indeed, as it was formerly named, a *peridiverticulitis*.

There appears to be a liability to lumbago, sciatica, and shingles.

DIAGNOSIS.—The diagnosis of diverticulitis is not difficult if the comparative frequency of the disease is kept in mind. The long history and well-being of the patient in the intervals of symptoms are characteristic. The absence of bleeding or mucus is against malignant disease, though their presence does not prove it, for they may both occur in diverticulitis. Of late it has become common for the diagnosis to be suggested or made before admission, or before X-ray examination. It is, however, not infrequently found when it has not been suspected, as must always be the case when no symptoms have arisen.

In all chronic cases, except those which have gone on to abscess with severe constitutional symptoms, a competent X-ray examination, if obtainable, is essential, and establishes the diagnosis. The chief common errors are to diagnose diverticulitis because some diverticula are seen, and to miss diverticulitis because the piece of bowel affected is not brought into profile, often no easy matter among the coils of the sigmoid flexure. When a narrowing is present without the characteristic appearance of diverticulitis, the presence of diverticula near-by, as shown by a barium meal or enema, makes it probable that the case is one of diverticulitis; but the possibility of cancer being also present is not excluded.

The sigmoidoscope usually gives negative information; it may show the under aspect of a stricture without the nodules which accompany a cancerous ring. Other diseases to be thought of are tuberculous, syphilitic, and actinomycotic inflammations of the sigmoid, diseases arising from neighbouring parts, and left-sided appendicitis.

PROGNOSIS.—The prognosis in diverticulitis depends upon how soon the disease is recognized and treated. It appears probable that in all early and in most advanced cases it can be arrested and kept indefinitely in check by suitable treatment. In advanced disease with a too narrow lumen of the bowel, if the area is localized and surrounding organs are not implicated, resection

may be practicable, with a prospect of complete relief. In others, if colostomy be done, the outlook for life is good, and in a few of these a further operation after much of the inflammation has subsided may restore the parts. If abscesses have formed and there are severe constitutional symptoms, the outlook is grave.

TREATMENT.—The treatment of an early case of diverticulitis is the same as that of diverticulosis, and consists in keeping the body, the alimentary canal, and especially the mouth and the colon, as healthy and clean as possible. Any source of sepsis that can be reached must be removed. The **Diet** should be simple and regular, with a good deal of fruit and vegetables, and little meat. A diet which is found useful is the following, but the preference and state of each person must be considered :—

8 a.m.—Coffee and milk; one tablespoonful of milk sugar; wholemeal bread; butter; honey or marmalade.

1 p.m.—Fish (cooked any way); butter sauce; salad and dressing; compôte of fruit; cream; toast and butter.

4 p.m.—Coffee or weak tea, with milk or cream; marmalade; wholemeal bread (toasted if desired) and butter.

7.30 p.m.—Vegetable soup; some egg dish (poached, scrambled, or omelette) with vegetables or fruit—for instance, jam or jelly omelette or omelette aux fines herbes; cream cheese; wholemeal bread; butter.

10 p.m.—Half an ounce of paraffin in 2 ounces of warm milk.

Meat is given two or three times a week to begin with, but later added daily, if desired, provided that regular actions are established. The milk sugar is a pabulum for the *Bacillus acidophilus*, which is given as mentioned below.

If there is such a degree of inflammation of the mucous membrane as to make it undesirable to give fruit, greens, or wholemeal bread, an entirely non-irritating or bland diet of cereals, milk, with fish or meat, is needed, at all events for a time. For example :—

Breakfast.—Bread and butter; jelly marmalade; coffee and milk.

Lunch.—A light meat dish or fish; potato; milk or steamed pudding or baked custard; fruit juice, apple or prune fool; toast; butter; cream; white cheese; digestive biscuits.

Tea.—Wholemeal bread and butter; sponge cake; jelly; cream; tea.

Dinner.—Fish or egg dish; potato; baked custard or cold sweet; fruit juice or purée with cream; bread; butter; cheese; biscuits.

But such a diet does not help the bowel generally to do its own work and contract its muscular wall frequently. It is contractions which promote the health of the gut and prevent stagnation of faeces in the lumen and in the pockets. Even if only a little fruit purée and sieved greens can be borne, they help to keep the bowels regular, aided by paraffin to grease the pouches and ensure that the motions are soft. Altering the flora of the gut by vegetable foods and *B. acidophilus* in milk also seems to do good.

Attention to habit is especially important. The patient is told to take plenty of time, giving a little strain every third breath, but never to strain hard.

Many authorities advocate a regular aperient once or twice a week, but it is better, if possible, to avoid irritation by regular purges, and to get the bowels working by the above-mentioned measures, reserving aperients for special needs. These may not arise if the patient has been helped by a period of daily observation and treatment.

The colon is washed out with **Normal Saline** every other day for a time, but at low pressure, the funnel being not more than eighteen inches above the level of the anus. The fluid runs in just as well as, or often better than,

at higher pressure, which may provoke spasm. In no case should a diverticulous area be massaged.

When diverticulitis is established the lavage is continued for longer, and in some cases permanently, at regular intervals. **Enemata** of 3 to 6 oz. of warm olive oil or liquid paraffin are sometimes useful, to be retained all night if possible. In some comparative tests it was found that the saline wash-out was more effective in emptying barium out of the pouches than was the injection of warm paraffin. The salines on the whole are more likely than the paraffin to set up discomfort, and even lumbago pains, in those liable to them. Perhaps this is because they flush the diverticula more thoroughly and increase absorption or irritation for the time.

The general health must be maintained by regulation of work, exercise, and rest; and moderation in the use of tobacco. Alcohol is thought, as a rule, to be harmful in this as in other forms of irritability of bowel or bladder. Motoring is not well borne by many patients.

W. J. Mayo² says, as regards the frequency of diverticulosis, that it is found post mortem in more than 5 per cent of persons over 40. It is nearly twice as common in men as in women, and equally frequent in the obese and the thin.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 569; ²*Ibid.* 574.

DRUG ADDICTION. (*See* ALCOHOL AND DRUG ADDICTION.)

DUODENAL ULCER. (*See* GASTRIC AND DUODENAL ULCER.)

DYSCHIEZIA. (*See* CONSTIPATION.)

DYSENTERY, AMŒBIC. (*See* AMŒBIASIS.)

DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

DISTRIBUTION AND ETIOLOGY.—J. A. Charles and S. H. Warren¹ report a bacteriological and clinical investigation of 355 cases reported as dysentery in an industrial area of the North of England with positive results in 141; they varied from very mild up to fatal attacks with high fever, and the **Serum** treatment was found to be of great value together with **Salines**. Post mortem the large bowel was less extensively inflamed than the small, especially the ileum, and the Flexner type of bacillus was found in 109 out of 141 positive cases, mostly the W and Z forms, while 26 showed Sonne and 6 a Newcastle type of dysentery bacillus. The cases tended to occur in house groups with the same type, and children up to fifteen years of age constituted 112 of the 141 cases, while the summer months showed most cases, infection being apparently mainly by house contact. T. A. Pratt and H. W. O. Frew² record an outbreak of 36 cases of dysentery in Glasgow in the summer of 1929, from a limited area, mostly in children up to ten years of age, due to the Flexner type of dysentery bacillus and of a mild type. A nurse attending cases in hospital became infected. A. T. W. Powell³ reports two small outbreaks of bacillary dysentery near Newcastle; one of these was due to Flexner W and the other to Sonne's bacillus, and the spread was due to contagion. A. G. Biggam and M. A. Arafat⁴ give a good illustrated account of the sigmoidoscopic appearances in bacillary, amœbic, and schistosome dysenteries seen in Egypt, based on 150 cases. They bring out the importance of the last-mentioned type and its resistance to treatment once papillomata have formed.

PROPHYLAXIS.—W. Walker and R. C. Wats⁵ report a trial in India of dysentery bilivaccine supplied by a Paris company in which 1400 inoculated

British troops in two stations showed 20 per cent of verified bacillary dysentery cases, but 3680 unprotected in the same troops showed only 14.1 per cent of such infections, therefore the trial was considered a failure.

TREATMENT.—A. Compton⁶ reports a trial of antidyentery **Bacteriophage** in bacillary dysentery in Egypt, with, he considers, good results. A polyvalent preparation, including four of D'Herelle's and three of his own strains, was used; he regards a reduction in the number of stools with general improvement in two days as 'very good' and by the fourth day as 'good', and he classes 45 as successes and 17 as failures. Cases of only one to three days' duration did much the best, while those of over seven days' duration gave comparatively poor results, as with other treatments, and in children under one year 83.3 per cent were failures. In the absence of controls it is very doubtful if these data prove anything. J. London⁷ reports on a trial of bacteriophage treatment of bacillary dysentery cases on an Assam tea estate, with 91 per cent of cures and 8.5 per cent of deaths among 141 cases, and in 72 cases treated with **Emetine** and **Salines** the cures were 87.5 per cent and the deaths 12.5 per cent, so he concludes that the results of the bacteriophage treatment "in general were very satisfactory", while he noted an early loss of toxicity and but few relapses. J. Taylor, S. D. S. Greval, and U. Thant⁸ report the complete failure of the bacteriophage treatment in 26 cases of bacillary dysentery with 20 control cases in Rangoon, and no relationship between the presence of natural or therapeutic phage and the progress of the case.

S. H. Jocelyn⁹ writes on the diagnosis and treatment of 56 cases of chronic dysentery, including sigmoidoscopic examinations, and he concludes that good results were obtained by **Colon Lavage** with Dakin's solution. In very severe cases with lesions high in the bowel he advises **Appendicostomy**, **Cæcostomy**, or **Ileostomy**, with good results in two of four cases with the more severe operations.

R. N. Chopra¹⁰ reports that the old Indian remedy, **Ispaghula**, consists essentially of mucilage, which has a beneficial purely mechanical action in chronic dysenteries.

REFERENCES.—¹*Lancet*, 1929, ii, 626; ²*Glasgow Med. Jour.* 1930, Feb., 82; ³*Brit. Med. Jour.* 1930, ii, 173; ⁴*Trans. Roy. Soc. Trop. Med.* 1930, Aug., 187; ⁵*Jour. R.A.M.C.* 1930, March, 190; ⁶*Lancet*, 1929, ii, 273; ⁷*Ind. Med. Gaz.*, 1930, July, 370; ⁸*Ind. Jour. Med. Research*, 1930, July, 117; ⁹*Trans. Roy. Soc. Trop. Med.* 1930, June, 39; ¹⁰*Ind. Med. Gaz.* 1930, Aug., 428.

DYSPEPSIA.

Ivor J. Davies, M.D.

S. M. Immerman¹ (Philadelphia) writes on the causes of indigestion and dyspepsia, and considers the various systems which give rise to abdominal disorders.

Cardiovascular System.—A careful examination of this system is always advisable, or the underlying cause (e.g., coronary disease) may be overlooked and operation performed. Diseases of the blood may be associated with abdominal complaints.

Genito-urinary System.—Renal calculus, hydronephrosis, renal ptosis, uræmia.

Lungs.—Pneumonia may have its onset with acute abdominal pain, sometimes suggesting an acute abdominal condition. Early pulmonary tuberculosis may give rise to indigestion before there is a chest complaint.

Infections and Intoxications.—Pyorrhœa alveolaris, sinus disease, Addison's disease, lead poisoning, toxic goitre, abuse of tobacco and alcohol.

Nervous System.—Neuroses, migraine, epilepsy, tabes, cerebral tumour, spondylitis and arthritis of the spinal vertebrae, self-imposed starvation.

Gastro-intestinal Tract.—Carcinoma of the colon, colitis, constipation, visceroptosis, appendicitis, gall-stones, diseases of the stomach, cardiospasm, carcinoma

of the œsophagus. This rather long list of conditions giving rise to abdominal disturbances may seem to make a diagnosis very difficult. A carefully taken history and a careful physical examination will enable a diagnosis to be made in the majority of cases without special aid.

REFERENCE.—¹*Med. Jour. and Record*, 1930, May 21, 518.

DYSPLASIA, HEREDITARY ECTODERMAL. (*See* HEREDITARY ECTODERMAL DYSPLASIA.)

EAR, DISEASES OF. (*See also* DEAFNESS; OTOSCLEROSIS.)

A. J. M. Wright, M.B., F.R.C.S.

Reflex Earache.—Cases of earache are occasionally met with in which the ear is normal and the pain is a referred one due to some lesion in a neighbouring part. At a meeting of the Royal Society of Medicine H. Tilley¹ pointed out that such a referred pain may be due to a lesion in the nasal sinuses, nasopharynx, pharynx, larynx, or the teeth. As examples he gave a sphenoidal sinusitis, a gumma of the opening of the Eustachian tube, a tonsillar calculus, an ulceration of the larynx, and an impacted wisdom tooth. Such a diversity of lesions necessitates careful examination to arrive at a diagnosis. In the ensuing discussion it was suggested that painting the suspected tonsillar region with a local anæsthetic would assist in diagnosis. The factor governing the transference of pain from a visceral region to the surface is the location of the ganglion cells of each afferent set of fibres in proximity in the same sensory ganglion. In these cases of reflex earache the reflex takes place between the facial and vagus nerves.

The Relation of Ear Conditions to Bathing.—This question is of some importance, an appreciable amount of ear infection being directly due to bathing. In some cases this is probably due to the insanitary state of the water, while in others the fault lies with the individual. W. I. Dagett and R. Cove-Smith² point out that acute otitis media is not infrequent as a result of the entrance of infected water into the Eustachian tube. Such entrance is most frequent with the inexperienced swimmer, and violent nose-blowing after emerging from the water should be avoided. In public baths every effort should be made to prevent contamination of the water, by frequent changes, filtration, etc. Individuals with a nasal infection, whether acute or chronic, should not be allowed to use public baths, both from the risk to themselves, and to others as a result of their introducing infection into the water. As a general rule, for the same reasons, individuals with perforated tympanic membranes should not bathe, and this also applies to those with an acute or chronic infection of the auditory meatus. (*See also* SWIMMING BATHS.)

Malignant Disease of the Ear (excluding the Auricle).—Malignant disease of the ear is not common, and is not easy to diagnose in the early stages. It is therefore worth while summarizing papers on this subject by E. B. Barnes and J. S. Fraser.³ The growth is almost invariably a squamous-celled carcinoma. Two types can be recognized: (1) Those in which the growth follows on an old-standing middle-ear suppuration—and in these it may start in the deep meatus or in the middle ear or mastoid process; and (2) Those in which there was no preceding suppuration and in which the neoplasm starts in the skin of the meatus. The former group is probably the larger, and the pre-existing suppuration tends to mask the onset of the new growth and thus to delay early diagnosis. The earliest symptoms are: pain, facial paralysis, and the presence in the meatus of granulations which show a tendency to bleed. Pain and facial paralysis occurring in the course of a middle-ear suppuration are in themselves indications for operation, but at

such operation the mastoid process may be found already extensively infiltrated with growth. In the second group early diagnosis should frequently be possible. There is no history of previous discharge, but pain with irritation and sanious discharge brings the patient to the surgeon. The picture is one of unilateral dermatitis of the meatus, and examination may disclose an infiltrated area, possibly covered by a horny layer. Therefore, in the words of Barnes, "in a case of resistant unilateral dermatitis, especially if any tissue resembling granulations can be seen, or if there is unusually free bleeding, an attempt should be made to obtain tissue for section."

TREATMENT.—In early cases in which the growth is confined to the meatus, excision of the cartilaginous and membranous meatus, with perhaps some removal of bone, will sometimes give good results. Thus, Fraser reports two cases alive six and eleven years respectively after such an operation. If the middle ear or mastoid process is involved, an extensive **Radical Mastoid**, with subsequent **Radium Treatment**, should be employed, but the prognosis in these cases is not at all good.

EXTERNAL EAR.

Deformity.—Deformities of the external ear are not uncommon, and the variety most often met with consists in a small, frequently pedunculated, and skin-covered nodule of subcutaneous tissue situated in the region of the pinna, and usually described as a supernumerary auricle. If regarded as unsightly, it can be quite easily removed. More severe degrees of maldevelopment are discussed by J. S. Fraser and E. D. D. Davis.⁴ Seven varieties of malformation of the auricle have been described: (1) The pointed or Darwinian ear; (2) The helix hangs down like a flap; (3) The lobule is split or absent; (4) The cat ear, in which the auricle is small and markedly concave; (5) The auricle merely forms a longitudinal swelling; (6) The auricle may be extremely rudimentary, or (7) absent. The auditory meatus may be occluded by connective tissue or bone, usually in association with deformity of the auricle. In such cases the tympanum and ossicles also show maldevelopment, but the Eustachian tube is usually normal. The labyrinth, being developed independently, does not as a rule take part in the deformity. In some cases facial paralysis and asymmetry of the face accompany the deformity of the ear. Owing to the presence of a normal cochlea, some degree of hearing is usually present. In cases showing atresia of the meatus attempts at its reconstruction by operation have not, up to the present, given good results. As far as the deformity of the pinna is concerned, if desired something can be done by **Plastic Surgery**.

G. W. Pierce⁵ states that the chief difficulties in such reconstructive operations are the obtaining of suitable skin and the prevention of contraction in the newly-formed pinna. He gives the detail of a method in which a new auricle is formed by the use of a rib cartilage graft or grafts and a tubed pedicle flap from the lower part of the neck.

Hæmatoma of the Auricle.—In the MEDICAL ANNUAL for 1929 (p. 136) a method of treatment by aspiration with subsequent pressure was described. R. C. Howard⁶ points out that hæmatoma is frequently followed by perichondritis and that the problem in the two conditions is the same. Hæmatoma and perichondritis are chiefly of importance in that, if neglected, they are liable to produce an unsightly deformity. Drainage through a simple incision is difficult to maintain. He has therefore adopted a method which he has found efficient in dealing with the similar problem of draining an abscess of the nasal septum. In the case of the septum, he advises the punching out

of a window of mucous membrane and cartilage, and in the case of the auricle, of a window or windows of skin and perichondrium, the number largely depending on the size of the swelling. [The reviewer has been in the habit of employing a similar method in dealing with septal abscesses and can vouch for its efficiency.—A. J. M. W.]

MIDDLE EAR.

CHRONIC SUPPURATIVE OTITIS MEDIA.

Vincent's (Fusospirillary) Infection of the Ear.—During the last few years attention has been drawn to the occurrence of cases of chronic middle-ear suppuration, apparently due to the organisms of Vincent. G. Busacca⁷ states that such organisms are present in 25 per cent of cases of chronic suppuration, and in the majority are responsible for keeping up the suppuration. In many of such cases local or constitutional treatment with **Neosalvarsan** will bring about a cure. A satisfactory method is stated to be the application of a 3 per cent solution on strips of gauze. He relates in detail cases of prolonged suppuration persisting after operation in which neosalvarsan applications produced rapid resolution.

L. H. Barenberg and J. M. Lewis⁸ relate three cases in children in which cure of an old-standing suppuration resulted in a few days with local applications of a 10 per cent solution of **Sulpharsphenamine** and 0.2 gm. of the same drug given intramuscularly. They point out that the appearance of a foetid bloody aural discharge is suggestive of a Vincent's infection.

Dry Treatment.—J. C. Beck⁹ gives the results of his experience with the non-operative treatment of chronic middle-ear suppuration over twenty-five years. He concludes that in the absence of labyrinthine irritation, headache, pain, or facial-nerve palsy, non-operative treatment should be persisted in for a considerable period. He has found that **Suction** carefully carried out through a small cannula is of value, particularly if combined with the insufflation of **Iodized Boric Acid**. He is of the opinion that the entry of water or the use of watery applications to the meatus should be studiously avoided, and emphasizes the importance of dealing with contributory factors in maintaining the suppuration, such as infected tonsils, adenoids, etc. M. D. Lederman¹⁰ writes very enthusiastically on the results obtained by such a method of dry treatment with iodine dusting powder (Sulzberger), and it was as a result of his experience that Beck adopted the method. After a preliminary clearing of the meatus and, as far as possible, the middle ear of discharge by suction, the powder is blown into the depths of the meatus and through the perforation. Applications are usually made twice a week. At the commencement a 0.5 per cent iodine powder is used, and later, if necessary, strengths up to 10 per cent may be safely employed. The powder is prepared by mixing an iodine solution of the desired strength with dry finely-powdered boracic acid and evaporating the solvent.

Late Results of Otitis Media in Infancy.—A series of children of from 7 to 16 years who had had otitis media in infancy were examined by C. C. Bunch and R. E. Grove¹¹ to ascertain what permanent damage, if any, had been produced. They found that 20 per cent showed some appreciable defect in hearing; in one-third of these the discharge still persisted, while dry perforations were present in one-sixth. In some cases, in spite of repeated myringotomies having been performed, the tympanic membranes were normal. The condition of the tympanic membrane gave little guide to the condition of the hearing. They investigated by the X rays the effect of the suppuration on the pneumatization of the mastoid process, and found that cellular

development might be extensive even in cases in which the suppuration had persisted for some years, thus supporting Cheatle's view that the 'sclerosed' mastoid is not always the result of disease.

COMPLICATIONS OF SUPPURATIVE OTITIS MEDIA.

Acute Mastoiditis: Anomalous Types.—While typical cases of acute mastoiditis with aural discharge, fever, and tenderness and swelling over the mastoid are easy to recognize, anomalous types are not infrequent and may lead to disastrous delays in diagnosis. A. J. M. Wright¹² classifies such cases as follows:—

1. *Without Aural Discharge.*—Cases presenting signs of inflammation of the mastoid process but with a normal, or simply an injected, tympanic membrane are not infrequently seen. Some patients give a history of profuse discharge, others do not. The explanation is that, while the middle-ear inflammation, suppurative or catarrhal, has cleared up, the infection in the mastoid process has progressed. E. Watson-Williams¹³ has noted 15 such cases out of a total of 300 mastoid operations. In all these 15 the condition was acute; some degree of pain was present in all; tenderness was usually present; fever was slight or even absent; and in 8 the tympanic membrane was normal.

2. *Latent Type.*—These are characterized by the triviality of the signs and symptoms. Thus, in one case following an otorrhœa of only twenty-four hours' duration the individual suffered from a vague earache, with a considerable diminution of hearing in the affected ear and a general feeling of unfitness. During this period the temperature was normal and the patient was able to continue his duties. The diagnosis rested on this history, combined with a localized tender spot towards the apex of the mastoid process and some degree of opacity and injection of the tympanic membrane.

3. *Fulminating Type.*—These cases are usually associated with hæmolytic streptococcal infection, which from the commencement widely invades the bone, producing severe constitutional disturbance. They are most commonly met with in association with epidemics of acute sore throat, and the aural discharge is unusually profuse, watery, and often sanious. Widespread tenderness develops early and a blood infection is not uncommon. Early operation is essential.

4. *Mastoiditis in Infants with Enteritis.*—This type was fully dealt with in the MEDICAL ANNUAL for 1929, p. 136.

5. *Parotid or Zygomatic Mastoiditis.*—The characteristic of this type is the presence of a swelling in front of the ear. F. Muecke,¹⁴ under the title of "Zygomatic Mastoiditis", classifies such cases into two groups occurring respectively in children and adults. In the juvenile type, after a period of earache and discharge, an inflammatory swelling appears in front of and above the ear. The meatus is generally closed as with a furuncle, and tenderness over the mastoid is slight or absent. The diagnosis made is frequently one of parotitis. The adult type is characterized by the absence of signs over the mastoid process with the presence of pain and swelling over the outer aspect of the orbit, simulating a frontal sinusitis. In both groups the condition is due to a suppuration in cells at the root of the zygoma. N. Asherson¹⁵ draws attention to a symptom of these cases: *œdema of the lid*. Such œdema may be associated with a zygomatic mastoiditis, or, as in the case related by Asherson, may be due to suppuration spreading forward superficially in the temporal fossa. The œdema is presumably due to interference with the venous or lymphatic return.

6. *Bezold's Mastoiditis*.—In this well-recognized type the suppuration perforates the tip of the mastoid process at its inner side, producing a swelling in the neck below the mastoid process.

7. *Spurious Mastoiditis*.—A number of conditions may produce some of the symptoms or signs of an acute mastoiditis, and among these may be mentioned a furuncle of the posterior meatal wall and herpes oticus. In the former case the retention of normal hearing and the slight degree of fever or constitutional disturbance assist in the diagnosis, but it may be impossible to be certain without an exploratory incision. Herpes oticus is a rare condition in which an herpetic inflammation of the ganglion of the VIIth and VIIIth cranial nerves gives rise to intense pain in and around the ear, with an eruption in the meatus and on the pinna, facial paralysis, and nerve deafness. This combination of earache, aural discharge, deafness, and facial palsy may lead to a mistaken diagnosis of acute mastoiditis.

TECHNIQUE OF MASTOID OPERATIONS: HÆMOSTASIS.—The control of bleeding during the course of a mastoid operation is of considerable importance. Those who have performed, or have seen performed, such operations under local anæsthesia must have been impressed with the great help which the bloodless field afforded. N. Asherson¹⁶ suggests the following technique to minimize the bleeding: Ten minutes before the anæsthetic has begun, the whole of the mastoid area is infiltrated with about 20 c.c. of **Novocain** solution (1 per cent) to which about eight drops of **Adrenalin** (1:1000) have been added. The injection is also carried along the postero-superior meatal wall. If this has been done, it is found that the incision and elevation of the flap are bloodless, that the plastic operation on the meatus is also bloodless, and that in the majority of cases bleeding from the bone is very much diminished.

Lateral Sinus Thrombosis.—The subject of blood-stream infection as a result of otitis media, whether with or without thrombosis of the lateral sinus or jugular bulb, is receiving a good deal of attention. It is of considerable importance to decide in any individual case whether infection with thrombosis has taken place within the sinus, and, if so, what degree of operative interference should be carried out. As showing that an aural involvement of the blood-stream can take place without thrombosis in the lateral sinus, H. I. Lillie¹⁷ has related nine cases in which such blood infection took place, but in all of which the condition cleared up as a result of clearing out the infection in the mastoid process, without interfering with the lateral sinus. Such a condition is most commonly met with in the early stages of a hæmolytic streptococcal infection. T. E. Bayer¹⁸ also publishes three cases in which pyæmia occurred from a mastoid infection without involvement of the lateral sinus.

It is not by any means always easy to decide, after exposure of the lateral sinus at operation, whether a thrombosis is present or not. G. Worms and Lacaze¹⁹ call attention to the fact that the sinus may have its ordinary deep blue colour and offer an elastic resistance even when it contains a developed clot. They and others regard puncture as being the most helpful means of deciding this, although in the case of a mural clot even puncture is not infallible. Various tests have been advised to show whether a sinus is blocked by clot or not, such tests depending on the effect on the cranial circulation of compressing the jugular veins alternately. In theory, compression of the patent vein, if one is obstructed, produces a rise in intracranial blood-pressure, which can be observed either by looking at the veins of the fundus of the eye with the ophthalmoscope, or by measuring the pressure of the cerebrospinal fluid. From a study of reports in the literature such tests seem of doubtful value. R. Ottenberg²⁰ describes a test depending on the result of differential cultures of the blood from the two jugular veins. Such cultures should show

a preponderance of colonies on the side on which the vein is affected, but the test is certainly not uniformly accurate.

TREATMENT.—It is curious that the surgical treatment of this not uncommon condition has not become more standardized. Thus, on the one hand, there are those who consider that in all cases in which it is reasonably certain that the lateral sinus is infected the jugular vein should be ligated in the neck. Others question the utility of this operation, and consider that the majority of cases do better if ligation is not carried out. M. Lickus²¹ in a series of fifteen cases ligated the vein on two occasions. Of the two cases ligated one died, and in the other case it was found impossible to tie below the clot. In the remaining cases there was only one death. He believes from these results that ligation is unnecessary and that, where it is followed by recovery, such recovery is not due to the ligation. A similar state of affairs exists in regard to cases in which it is believed that the jugular bulb is thrombosed, either with or without involvement of the lateral sinus also. D. McKenzie²² is in favour of radical operations including exposure and opening of the bulb. J. L. Maybaum and I. B. Goldman,²³ in a full consideration of the subject of bulb thrombosis, consider that direct operation on the bulb is unnecessary in the great majority of cases, it being sufficient to clear the bulb as far as possible with a curette from the opening in the lateral sinus. Broadly, it would seem that while ligation of the internal jugular vein was established many years ago as an obvious means of preventing further infection entering the circulation, many observers are becoming doubtful as to whether, in fact, it does attain this object.

Abscess of the Brain.—H. Neumann²⁴ drew attention to the curious fact that while Macewen fifty years ago had a recovery-rate of 80 per cent in cases of temporal-lobe abscess, the figures of operators at the present day show below 30 per cent. It is possible that this difference in results is explained by the fact that Macewen operated at a late period in the history of the case, when the abscess was more localized. The difference is even more striking in the case of cerebellar abscess, Macewen having four cases which were all successful, whilst the average present-day recovery-rate seems to be 12 per cent. Considering how the present poor results may be improved, Neumann has come to the conclusion that earlier diagnosis is necessary. When the general signs and symptoms suggest the existence of an abscess, he considers that an exploratory puncture of the brain should be carried out, rather than waiting for the development of focal symptoms, which tend to occur late in the history of the case. He is in favour of puncturing through an intact dura rather than through an incision. He cannot report favourably on the method of drainage introduced by Lemaitre, in which a filiform drain is first introduced, and dilatation of the drainage track is carried out by gradually employing larger drains. He issues a warning note in regard to the lasting cure of brain abscess, such cases not infrequently relapsing after they have apparently healed.

H. Cairns²⁵ suggests that one possible reason for the discrepancy between Macewen's results and those of other surgeons may be that the former avoided the use of mallet and gouge, the action of which may possibly be harmful in such cases. As far as the focal signs of temporal-lobe abscess are concerned, he emphasizes the importance of carrying out daily perimetric examinations, having found a homonymous quadrantic defect in the field one of the most useful signs. In regard to exploratory puncture, he first shuts off the mastoid wound from the field of exploration with gutta-percha tissue, and then punctures the brain through a small perforation above the level of the zygoma. This method obviates the risk of introducing infection. In addition

to the inability to discover pus on exploration, other signs may strongly suggest the absence of a cerebral abscess. These are: the finding of free pus in the subdural space, indicating a purulent pachymeningitis; an abundant flow of cerebrospinal fluid from the subarachnoid space, or from the temporal horn of the lateral ventricle; and the naked-eye examination of the fragment of brain substance in the needle. If this latter is apparently healthy, abscess is unlikely.

W. P. Eagleton²⁶ also stresses the value of repeated examination of the visual fields in the diagnosis of brain abscess.

Lumbar Puncture.—Eagleton emphasizes the risk attached to lumbar puncture in cases of cerebral abscess. If one is done in a case of suspected cerebral abscess, only a small amount of fluid should be withdrawn. G. V. T. Borries²⁷ states that the quality of the spinal fluid in cases of brain abscess may vary from the normal to the turbid and infected. He gives a classification into four types: (1) Normal fluid where there is no associated meningitis. This type is uncommon. (2) Clear and sterile fluid, with an increase in the cell content indicating a slight degree of meningitis. This type is frequently met with. (3) Turbid but sterile fluid with a high cell content consisting mostly of lymphocytes. This type is frequent. (4) A turbid fluid, with a high cell content containing numerous polynuclear cells and organisms and indicating a diffuse purulent meningitis.

INTERNAL EAR.

Ménière's Syndrome.—A detailed investigation of 135 cases of this condition has been published by S. H. Mygind.²⁸ In selecting cases for investigation those possibly due to syphilis, parotitis, encephalitis, cerebral tumour, disseminated sclerosis, etc., have been excluded. He found that spontaneous nystagmus is always present during the attacks, but is only occasionally met with in the intervals. Cases can be grouped into: (1) Those in which the vestibular tests show a diminished reaction, and in these the hearing is usually markedly affected; and (2) A much larger group in which the symptoms are less severe and vestibular tests give a normal reaction. The giddiness varies from a vague sense of unsteadiness to the classical apoplecticiform seizure. A sense of vertical motion is almost as frequently met with as a sense of rotation. Periodicity in the attacks is frequent, and patients usually recognize prodromal warnings, such as headache, tinnitus, or a feeling of pressure in the ears. Pointing tests were found to be of no practical value. The fistula reaction is present in a few cases, and it is suggested that this may be due to undue laxity of the stapes. Mygind concludes that Ménière's syndrome is due undoubtedly to an affection of the labyrinth, probably of the nature of an increase of fluid and not of the nerve or nucleus. Only after repeated attacks of such pressure and stasis do permanent alterations of structure and losses of function occur.

Under the title of "Dropsy of the Labyrinth", P. Zaviska²⁹ has followed the classification of Wittmaack into cases of tympanic origin and those arising from the meninges and from the blood. Nine cases are related with symptoms of labyrinthitis in association with acute otitis media which cleared up under the administration of **Pilocarpine**. Similar cases may occur following the radical mastoid operation. A series of cases of acute labyrinthine dropsy associated with meningeal disorders also cleared up with **Lumbar Punctures** and pilocarpine. He suggests that in some cases of deaf-mutism the labyrinthine nerve structures have been destroyed by an acute labyrinthine excess of fluid. Diabetes and such chronic infections as osteomyelitis are responsible for the blood-borne cases. Pilocarpine, by its action on the endolymphatic

secretion with promotion of the elimination of toxic products, is of great use in Ménière's syndrome or in deafness due to labyrinthine affections, but is of no help in cases due to an affection of the auditory nerve.

The treatment of cases of vertigo of labyrinthine origin with **Adrenalin** is advised by K. Vogel.³⁰ Of 74 cases treated, more than half are claimed to have been cured, some of these being old-standing cases. The improvement did not occur until about twenty-four hours after the administration of the adrenalin, which was given by subcutaneous injection in doses of 0.3 to 0.5 c.c. of 1-1000 solution. In some cases a single injection is stated to have permanently cured, while in others subsequent injections were necessary at intervals of a few weeks. In some of the cases in which adrenalin was unsuccessful, **Euphyllin**, a vasodilator, given intravenously in doses of 0.48 c.c. has proved successful. The injection must be given slowly to avoid too sudden a fall in blood-pressure.

Syphilis of the Internal Ear.—As a result of the careful study of audiograms (see DEAFNESS, p. 123), D. W. Drury³¹ noted in 10 per cent what he describes as a 'dipper curve' at the level of 4096 d.v. An analysis of these cases showed a high incidence of syphilis, and he regards a defect in hearing of this particular part of the scale as being suggestive of a diagnosis of syphilis. Even when a syphilitic infection is undoubtedly present, treatment does not remove the hearing defect.

E. Feuillié and Ruaud³² emphasize the frequency of syphilis in patients suffering from a progressive deafness of tubotympanic origin, particularly in those under 25 years old. The infection may be acquired or hereditary, and the authors claim that antisypilitic treatment will frequently succeed in cases in which local measures carried out for some years have completely failed to effect a cure.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1929, July, 1279; ²*Brit. Med. Jour.* 1929, ii, 296; ³*Proc. Roy. Soc. Med.* 1930, June, 1231; ⁴*Jour. Laryngol. and Otol.* 1929, Aug., 548; ⁵*Surg. Gynecol. and Obst.* 1930, March, 601; ⁶*Laryngoscope*, 1929, Sept., 590; ⁷*Arch. Internat. de Laryngol.* 1929, xxxv, 295; ⁸*Jour. Amer. Med. Assoc.* 1930, April 5, 1065; ⁹*Ann. Otol. Rhinol. and Laryngol.* 1929, Dec., 1150; ¹⁰*Laryngoscope*, 1930, June, 397; ¹¹*Ann. Otol. Rhinol. and Laryngol.* 1930, March, 1; ¹²*Brit. Med. Jour.* 1930, i, 437; ¹³*Ibid.* 1929, ii, 1040; ¹⁴*Jour. Laryngol. and Otol.* 1929, Aug., 535; ¹⁵*Ibid.* Dec., 827; ¹⁶*Lancet*, 1929, ii, 1359; ¹⁷*Jour. Amer. Med. Assoc.* 1930, Feb. 22, 529; ¹⁸*Laryngoscope*, 1928, Dec., 785; ¹⁹*Bull. et Mém. Soc. nat. de Chir.* 1929, lv, 138; ²⁰*Jour. Amer. Med. Assoc.* 1928, Nov. 17, 20; ²¹*Zentralb. f. Hals-, Nasen- u. Ohrenheilk.* 1929, xiv, 94; ²²*Jour. Laryngol. and Otol.* 1929, Aug., 527; ²³*Laryngoscope*, xxxviii, No. 9, 569; ²⁴*Jour. Laryngol. and Otol.* 1930, June, 377; ²⁵*Ibid.* 385; ²⁶*Laryngoscope*, 1930, May, 336; ²⁷*Ann. des Mal. d'Oreille*, xlvii, 452; ²⁸*Acta Oto-laryngol.* 1929, xiii, 393; ²⁹*Otolaryng. Star.* 1929, i, 113; ³⁰*Acta Oto-laryngol.* 1929, xiii, fasc. 3; ³¹*Ann. Otol. Rhinol. and Laryngol.* 1929, Sept., 625; ³²*Jour. Laryngol. and Otol.* 1929, Aug., 561.

ECTODERMAL DYSPLASIA, HEREDITARY. (See HEREDITARY ECTODERMAL DYSPLASIA.)

ECZEMA, SKIN SENSITIZATION IN. (See SKIN SENSITIZATION.)

ELECTROCARDIOGRAPHY. (See ARRHYTHMIA AND ELECTROCARDIOGRAPHY.)

ELEPHANTIASIS OF THE LOWER EXTREMITIES. (See also FILARIASIS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

The reviewer has recently seen a lady, age 62, in whom elephantiasis has existed in both legs for over ten years. The patient was the subject of chronic rheumatoid arthritis. Her knee-joints, the joints of her fingers and wrists, etc., were distorted and stiff for thirty years. She had never been abroad. The

elephantiasis increased during the last twelve months, the lower thirds of her legs becoming ulcerated and extremely painful. Any palliative operation was thought impossible, not only owing to the enormous size of the legs, but to the coexisting ulcers. Amputation was performed through the left knee-joint under gas-oxygen anaesthesia. The joint was partially ankylosed; the cartilage had the typical appearance of old-standing rheumatoid arthritis. Owing to the œdematous swelling of the thigh, a tourniquet could not be used. When the knee-joint was opened the knife was slipped behind the tibia and the tissues were separated from the bone. It was then possible to grasp the popliteal vessels before division. In two months the stump was soundly healed and gradually shrank to normal dimensions. Three months later the right leg was amputated by the old Stephen Smith method. The vessels were controlled in the manner already mentioned. The appearance of the right leg before operation is shown in the accompanying photograph (*Plate XI*). The big toe can just be seen projecting from the inner side of what was once the foot. The pathological report stated that, although the leg was œdematous, ulcerated, and enormously distended, and the skin greatly thickened, the tissues were not as hard as in tropical elephantiasis. "There are four or five ulcers with hard edges and black unhealthy floors. The edge shows granulation tissue full of pus on the surface and very hæmorrhagic."

This case with the history of crippling rheumatoid arthritis bears out the contention of Matas, who maintains that repeated bacterial invasion, usually by the streptococcus, is essential in the production of elephantiasis. These points are brought out by M. Weinstein,¹ who also quotes Sistrunk, of the Mayo Clinic, as stating that several patients developed elephantiasis independently of venous or lymphatic obstruction, and solely as a result of repeated attacks of streptococcus infection. The patient alluded to by the reviewer had prolonged and repeated waves of bacterial infection. Weinstein reports a case subsequently treated by Kondolón's operation. His conclusions are as follows: (1) An advanced case of elephantiasis of the lower extremities was operated upon by Kondolón's method and is steadily improving. (2) The patient's past history of repeated bacterial infection substantiates the recent theory that the streptococcus is the etiological factor. The filariæ were never isolated from the blood. (3) Kondolón's operation is the procedure of choice at the present time. (4) Accidental severance of the right external popliteal nerve, followed by immediate repair, yielded complete regeneration in nine months.

D. J. Harries² describes a case of non-filarial elephantiasis in a patient aged 40. The history extended over twenty-three years. The patient was cured by the Kondolón operation, which the writer regards as easy and devoid of risk. The greater part of a year elapsed before the limb became normal.

REFERENCES.—¹*Amer. Jour. Surg.* 1929, Nov., 704; ²*Brit. Med. Jour.* 1930, Dec. 27, 1079.

EMBOLISM. (*See BLOOD- AND LYMPH-VESSELS, SURGERY OF.*)

EMBOLISM, PARADOXICAL.

A. G. Gibson, M.D., F.R.C.P.

T. Thompson and W. Evans¹ have reviewed the present position of our knowledge of paradoxical embolism and report five fresh cases. This type of embolism is that depending on patency of the foramen ovale or the inter-ventricular septum, so as to allow an embolus from the venous system to enter the arterial system directly. The authors separate three types dependent upon (1) thrombosis in the venous system, (2) malignant growths, and (3) pyæmia. Of the 4 reported cases of the first type, 3 had cerebral emboli,

PLATE XI

ELEPHANTIASIS



The right leg before operation in a lady of 62, the subject of rheumatoid arthritis.
The left leg was amputated for a similar condition.

and one of these, a woman of 38 years, after complete motor aphasia with right hemiparesis, recovered sufficiently to carry on her work as a secretary. In the second type the group includes primary growths of several organs, but no fewer than 8 out of 15 were due to carcinoma of the bronchus. In the third group of pyæmia, the embolism frequently involves the cerebral arteries and produces an abscess.

Pulmonary embolism is frequently associated with embolism of the systemic circulation in these cases, and was estimated by Wittig to be present in 50 per cent. In 24 per cent pulmonary embolism had preceded the paradoxical embolism. A figure is given of a case, under the care of T. R. Elliott, of a long embolism partly in the right and partly in the left auricle.

REFERENCE.—*Quart. Jour. Med.* 1930, Jan., 135.

EMBOLISM, PULMONARY. (See PRE- AND POST-OPERATIVE TREATMENT.)

EMPYEMA.

A. Tudor Edwards, M.Ch., F.R.C.S.

In the majority of papers written on this subject during the last year the most noticeable feature is the increased tendency to stress the importance of drainage by some form of negative pressure and the increasing use of irrigation for the more efficient solution of the pyogenic membrane lining the empyema cavity.

D. Hart¹ describes a method by which empyema can be treated by **Tidal Irrigation**. The operation is carried out by the intercostal introduction of a large catheter, which is connected to a somewhat complicated collection of bottles and by means of which the whole empyema cavity is kept constantly filled with the irrigating fluid. A slow but steady renewal of the irrigating fluid is maintained, and although fluid flows in and out on expiration and inspiration, the more solid contents are withdrawn by gravity from the circulation and cannot re-enter the empyema cavity. Hart states that rib resection is required in only a small proportion of cases, and only about one-seventh require open drainage, this being necessary owing to the small sizes of the cavities. Of 57 patients treated, 6 died, and these deaths were due to widespread general infection. The most obvious criticism of this method is the bulky and complicated nature of the required apparatus and the necessity for constant skilled attention to maintain its adequate functioning. It is more than doubtful that it will be widely adopted.

K. D. Panton² discusses another and simpler method for negative drainage through an intercostal tube, which in the later stages of convalescence is portable.

R. Demel,³ in discussing the treatment of acute non-tuberculous pleural empyema, advises **Intercostal Drainage**. His method consists of the insertion of the cannula-trocar into adjacent intercostal spaces. When rotated into position the two cutting edges of the trocars fit against one another, making a loop which has two lateral openings for drainage. A firm clip holds the cannulae together outside the chest, and their ends are attached to two rubber tubes which are connected with a bottle, from which the air is exhausted at intervals by a suction pump. This method has the advantage of simplicity, but requires special apparatus in the way of metal trocars of various sizes.

C. A. Roeder,⁴ in contradistinction to the majority of surgeons, advocates **Open Operation** with no attempt at the maintenance of negative-pressure drainage. Obviously the cases in which he advises wide exposure of the empyema cavity are bounded by definite adhesions and are therefore localized.

His method consists in a four-inch incision into the pleura after resection of a similar amount of rib, removal of all fluid and flakes, and division of all adhesions. The parietal pleura is sutured to the skin and the whole cavity is packed with bismuth-iodized gauze. The advantages which the author puts forward for the **Gauze Pack** are: (1) It holds the lung steady following operation; (2) It clears the exudate rapidly from the walls of the cavity; (3) It breaks up the numerous small abscesses which are usually present in the periphery of the lung; (4) It eradicates external purulent drainage almost completely after forty-eight hours; and (5) It brings about an obliteration of the cavity at least as rapidly as any other method. The disadvantage, he states, is that the gauze needs to be changed daily and needs skilled dressing, and, in addition, the first dressing usually requires light anaesthesia, as it is otherwise very painful.

C. McNeil⁵ discusses the treatment of empyema in children by **Repeated Aspiration** and **Cannula-aspiration**. He aspirates the infected fluid from the chest three to four times over a varying period, usually about two weeks. If more than one ounce of pus was then still obtained, a short silver cannula with a wide circle-hilt was passed into the pleura by a trocar and secured to the chest. About one inch of aspirating tubing was fitted to the cannula and stoppered or clipped. Pus was aspirated from the cannula according to the amount secreted. The results in 61 cases over a period of eight years are given. In the first two years of life there were 24 cases with 13 deaths; in the third year, 14 cases with 3 deaths; from the third to the twelfth years, 23 cases and 2 deaths. McNeil advises cannulae of a calibre of 3.25 and 4.25 mm. to avoid necrosis of the adjacent ribs. In addition to aspiration, the instillation of 5 to 10 c.c. of 10 per cent **Iodoform** in sterile liquid paraffin is used, chiefly to prevent irregular and premature adhesion of the pleural surfaces.

B. Douglas⁶ advises **Air-tight Drainage** of the empyema after partial rib resection. The necessary bottles for siphon drainage are connected with the drainage-tube, and the negative pressure is kept at the right amount by a difference in level of the bottles of 24 in. The statistics recorded by this author show a mortality of 15.4 per cent under two years of age, and 5.7 per cent over two years. Those figures can be regarded as a considerable improvement on the generally recorded statistics, especially for the under-two-years group. No case of chronic empyema resulted in this series of 48 cases.

H. W. Hudson, jr.,⁷ in a paper on acute empyema thoracis in which a report on 86 cases is given, reviews the whole subject of aspiration alone, aspiration followed by intercostal drainage, and aspiration followed by rib-resection drainage. He lays considerable stress on the condition of the fluid withdrawn by an exploring needle. "The etiological organism and the character of the exudate often determine the initial procedure to be employed." No case should be operated upon during the synpneumonic stage, and it is better to delay well into the metapneumonic phase. Aspiration is the treatment of necessity during this waiting period.

Late intercostal drainage is reserved for: (1) Those patients so ill that the more extensive rib resection is to be avoided because of shock; (2) In infants under one year as a primary operative procedure; (3) In those patients with a thin exudate and a culture showing other organisms than pneumococci. The operation was selected for 32 patients; 6 died, 12 recovered, and 14 were later subjected to rib resection and recovered: 52 patients were subjected to rib resection, with 5 deaths. Hudson's conclusion is that rib resection for empyema in children as a primary operation in selected cases, or preceded by

repeated aspiration or intercostal drainage during the synpneumonic stage, is a valuable therapeutic measure.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1929, Nov. 30, 1724; ²*Canad. Med. Assoc. Jour.* 1930, March, 368; ³*Arch. f. klin. Chir.* 1929, Aug., 547; ⁴*Amer. Jour. Surg.* 1930, March, 611; ⁵*Practitioner*, 1930, July, 219; ⁶*Ann. of Surg.* 1930, May, 659; ⁷*New Eng. Jour. Med.* 1930, May 1, 853.

ENCEPHALITIS, EPIDEMIC.

J. D. Rolleston, M.D.

ETIOLOGY.—C. H. Andrewes and E. A. Carmichael¹ remark that two main views are current concerning the etiology of encephalitis lethargica, one being that the disease is carried by the virus of herpes simplex, which under exceptional circumstances becomes neurotropic for man; and the other that the cause of encephalitis lethargica is an unknown specific neurotropic virus. The writers accordingly examined the serum of 25 patients with post-encephalitic Parkinsonism and that of 28 unselected controls, and found antibodies to herpes virus in 72 per cent of the former and in 75 per cent of the latter. Their observations therefore give no support to the view that the virus of herpes simplex is the essential cause of encephalitis lethargica.

SYMPTOMS AND COMPLICATIONS.—According to A. Blaizot² the *peripheral forms* of epidemic neuraxitis (a term invented by Sicard as being more comprehensive than epidemic encephalitis) comprise numerous clinical types, including an algo-myoclonic form, and types resembling poliomyelitis, spastic paraplegia, Landry's paralysis, and tabes. The polyneuritis of epidemic neuraxitis usually appears in the form of simple paraplegias or as paraplegias with involvement of the cranial nerves or quadriplegias. In some cases only the terminal part of the nerves is involved or the muscle only, giving rise to a pseudo-myopathic form of the disease. In spite of the variety of these clinical forms, the arguments in favour of their being due to the same cause are their occurrence during an epidemic, a previous history of ocular palsies and lethargy, the existence of transitional forms in the same individual, and the character of the cerebrospinal fluid, which is almost invariably the same in all cases. The fluid is clear under slight pressure, with only slight lymphocytosis but a considerable increase of albumin. The chlorides are not affected, and the Wassermann reaction is always negative.

Although numerous cases of epidemic encephalitis with involvement of the vestibular connections have been reported, a predominance of *cerebellar symptoms*, of which H. Jenkins³ reports two examples, is less frequent. In his first case, which occurred in a male, age 18, the typical symptoms of epidemic encephalitis were associated with a cerebellar gait, staggering, hypotonia and dysmetria in the left extremities; while in the second case, which occurred in a man of 56, the cerebellar symptoms were still more pronounced. It is noteworthy that cell changes have been found post mortem in cases of encephalitis in which during life cerebellar symptoms did not occur or were not prominent.

In a thesis on *epidemic encephalitis and pregnancy* E. L. D. Debon⁴ comes to the following conclusions: (1) Pregnancy causes an aggravation of epidemic encephalitis which is most pronounced at the time of delivery. (2) Pregnancy rouses dormant forms of encephalitis into activity, thus explaining the frequency of sporadic cases of acute lethargic encephalitis developing during pregnancy. (3) A woman who has had lethargic encephalitis and has shown no evidence of recrudescence during pregnancy may be regarded as cured. (4) Epidemic encephalitis often gives rise to abortion, death of the foetus in utero, and premature confinement. (5) Transmission of the virus to the foetus by the placenta has been demonstrated. The maternal milk also probably transmits the virus, though this has not been proved. (6) Breast feeding is contra-indicated in all forms of active lethargic encephalitis.

A. Netter⁵ has collected 16 cases of *herpes zoster associated with epidemic encephalitis*, in 4 of which the onset of herpes was concurrent with that of encephalitis, while in 10 herpes developed subsequently, the interval ranging from a week to five years. The rarity of zoster in encephalitis suggests that the part played by encephalitis in the production of zoster is merely confined to preparation of the nerve area that is attacked by the specific agent of zoster. P. Hombourger⁶ also records a case of a man in whom intercostal zoster was concurrent with a paraplegic form of epidemic neuraxitis.

According to I. Lumbroso,⁷ who reports fourteen illustrative cases in patients aged from 8 to 38, *epilepsy* due to epidemic encephalitis is more frequent than is generally supposed. The forms which it assumes are generalized convulsions of the tonic and clonic type, Jacksonian attacks, purely tonic attacks, and epileptic equivalents of a motor, sensory, or psychical character. Excellent results in such cases are said to have been obtained by **Fixation Abscesses**, injections of **Urotropine**, or **Arsenical Preparations**.

According to G. R. Kamman,⁸ the principal symptoms of *narcolepsy*, of which he records an example following epidemic encephalitis, are as follows: (1) Periodic attacks of involuntary sleep, and (2) Attacks of temporary loss of tone in the involuntary muscles brought on by some emotional stimulus. Kamman's patient was a female school teacher, age 36, in whom these symptoms followed an acute attack of encephalitis. All treatment was ineffectual, but the patient was able to continue her professional work.

DIAGNOSIS.—G. P. Frets⁹ reports three cases in which the diagnosis of chronic epidemic encephalitis was made before death, though the diagnosis in two was first dementia præcox or psychasthenia, and in the third a toxic psychosis of tuberculous origin. In the first case obstinate insomnia at the onset was a striking symptom; in the second case a chronic suppurative otitis media was misleading. In the late stage, however, all three patients showed signs of Parkinsonism. In each case the diagnosis was confirmed by the post-mortem examination, which showed definite though slight lesions, which were most marked in the mid-brain and spinal ganglia.

TREATMENT.—C. Worster-Drought and T. R. Hill¹⁰ report satisfactory results in the treatment of encephalitic Parkinsonism from oral administration of **Extractum Stramonii (U.S.P.)** in doses of from 0.25 gr. to 1 gr. or more, three times a day, the average dose being 0.75 gr. **Tinctura Stramonii**, which according to Worster-Drought and Hill is twice as expensive as the extract, is recommended in larger doses (30 to 70 min.) three times a day by A. L. Jacobson and F. Epplen¹¹ as an excellent palliative for all the symptoms of Parkinsonism. Toxic manifestations such as paresis of accommodation, xerostomia, and nausea were rare and evanescent.

REFERENCES.—¹*Lancet*, 1930, i, 857; ²*Thèse de Paris*, 1929, No. 173; ³*Arch. of Neurol. and Psychiat.* 1929, 469; ⁴*Thèse de Paris*, 1929, No. 23; ⁵*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1930, 793; ⁶*Ibid.* 791; ⁷*Thèses de Montpellier*, 1928-9, No. 22; ⁸*Jour. Amer. Med. Assoc.* 1929, xciii, 29; ⁹*Nederl. Tijds. v. Geneesk.* 1930, 484; ¹⁰*Lancet*, 1930, i, 1225; ¹¹*Jour. Amer. Med. Assoc.* 1929, xciii, 2027.

Macdonald Critchley, M.D.

Pregnancy and Epidemic Encephalitis.—The association of pregnancy with acute epidemic encephalitis as well as with the chronic manifestations of the disease, e.g., Parkinsonism, is an important problem which constantly faces the practitioner. Questions as to the future of the mother and of the infant and as to the advisability of inducing premature labour will urgently arise. F. W. Roques¹ has studied these problems with the greatest detail and has arrived at important conclusions, based upon a study of 40 personal cases and 171 cases collected from the literature. The chief points in his summing up are as follows:—

1. The course of acute epidemic encephalitis is not altered in a woman by the fact that she is pregnant. Mortality, as gleaned from collected statistics, is about 42 per cent. In the majority of cases labour does not influence the course of the encephalitis, though in a few cases there has been an aggravation and in others a betterment.

2. Miscarriage or premature labour occurs in some of the most severe cases. There is no evidence that pregnant women with epidemic encephalitis are especially prone to toxæmic manifestations.

3. Infection with encephalitis seems to be commoner during the later months of pregnancy or in the puerperium than during the first half of gestation. It appears that the mortality is greater when infection takes place early.

4. The risk to fœtus and infant is slightly higher than to the mother, the mortality amounting to 46 per cent. The prognosis of the child varies directly with that of the mother. Sufficient cases are on record to substantiate 'encephalitis neonatorum' as a definite, though rare, clinical entity. Infection from mother to infant, when it occurs, seems to take place via the placenta. If the infant negotiates the first few weeks of life, there is little likelihood of subsequent development of the disease; the existence of 'acquired epidemic encephalitis of the new-born' is questionable.

5. Acute epidemic encephalitis in the mother is not an indication for terminating pregnancy; the second stage of labour should be expedited by forceps as quickly as possible. The tax of lactation should not be placed upon the mother.

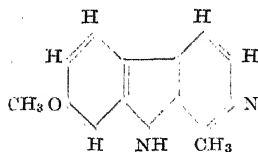
6. When pregnancy occurs during a state of post-encephalitic Parkinsonism, an aggravation of the neurological condition occurs in the majority of cases. Pregnancy, however, is not usually affected by the concomitant presence of Parkinsonism; labour is easy and puerperal complications are very uncommon. There is no evidence that the prognosis of the child is directly altered by the presence of Parkinsonism in the mother.

7. Parkinsonism not infrequently makes its first appearance during pregnancy.

8. Women recovered from acute epidemic encephalitis and also those in a state of Parkinsonism should avoid maternity.

9. Terminating pregnancy is probably indicated in cases of Parkinsonians whose symptoms are aggravated or precipitated during gestation.

The Treatment of Post-encephalitic Parkinsonism with Harmine and Banisterin.—Banisterin is the alkaloidal active principle of a shrub, ayahuasca, or *Banisteria caapi*, which is found in the equatorial forests of South America. Amongst the tribes inhabiting the interior of Brazil, Ecuador, Venezuela, Colombia, and Peru, the plant is employed by the medicine-men in certain religious rites, in association with another drug named 'jagé'. Ayahuasca is said to produce a state of delirious excitement accompanied by vivid optical hallucinations.² Wolfes and Rumpf³ were the first to isolate in 1918 the active principle 'banisterin', an alkaloid with the formula:—



The pharmacological properties are those of a motor excitant which markedly slows the heart.

Wolfes and Rumpf realized that banisterin was chemically identical with another alkaloid named 'harmine' which had been isolated by Fritsche in 1847 from the seeds of the *Peganum harmala*. This plant grows in the Near

East, along the Mediterranean shore, and in Russia; it is identical with the 'wild rue' of Dioscorides. J. A. Gunn⁴ in 1929 demonstrated that these two alkaloids were also identical in their pharmacological properties.

Early in 1928 banisterin was first used in the treatment of post-encephalitic Parkinsonism, but owing to the rarity of the South American ayahuasca, and the observations of Gunn, it has since been superseded by its isomer, harmine. Reports as to its value in the treatment of the encephalitic sequelæ were made by K. Beringer⁵ and were rapidly followed by others, particularly from workers in Germany (Lewin and Schuster,⁶ Stern,⁷ A. Fischer,⁸ P. Schuster,⁹ E. Rustige,¹⁰ H. Pinéas,¹¹ J. Mouzon,¹² J. Decourt,¹³ K. Beringer and K. Wilmans¹⁴). The drug has been administered hypodermically, in doses of 0.02 to 0.04 grm. twice weekly, or by the mouth. Oral administration is followed as a rule by less marked effects, which are somewhat delayed in appearance. The general experience has been that harmine has a temporary beneficial effect upon the patient's rigidity; the ability to perform voluntary actions is also improved, so that the rapidity, range, and speed of movements may be distinctly enhanced. Tremor may be improved, but only to a slight degree and in the minority of individuals; there is no effect upon salivation. In this country T. R. Hill and C. Worster-Drought¹⁵ have recorded their experience with harmine in thirty-eight cases; the drug was administered both hypodermically and by the mouth. Their results were disappointing; they found no perceptible objective or subjective improvement in any of their patients' symptoms when doses up to 0.04 grm. were given subcutaneously. One patient alone, a boy of 13 suffering from a post-encephalitic respiratory disorder, improved as to the severity and duration of his attacks of apnoea and dyspnoea. A similar benefit to respiratory symptoms had been noted by Rustige in one case.

Experiences with the use of this drug in post-encephalitic patients at the National Hospital, Queen Square, have been equivocal. It was employed in the form of $\frac{1}{4}$ -gr. tablets given by mouth twice or thrice daily. In some cases the alkaloid **Harmaline**—also present in *Peganum harmala*—was tried. The majority of patients showed no improvement in their symptoms, either subjectively or objectively, while taking harmine or harmaline; a marked amelioration was noted as soon as these alkaloids were replaced by **Stramonium** or **Hyoscine**. A distressing feature has been described by most observers—namely, the occurrence of untoward symptoms such as nausea and vomiting, headache, vertigo, and syncope. In but a few patients was there any definite diminution noted in the intensity of the Parkinsonian symptoms; it was concluded that more extensive trial with this drug was worth while, particularly in small dosage administered more often and in gradually increasing quantity.

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ENDOCARDITIS, SUBACUTE INFECTIVE.

A. G. Gibson, M.D., F.R.C.P.

Thayer, of Baltimore, drew attention in 1926 to the danger of extraction of teeth in subacute infective endocarditis. Martin A. Rushton¹ reports such a case in a boy, age 10 $\frac{1}{2}$ years, with congenital pulmonary stenosis, who after the extraction of the first tooth developed a temperature, which rose further on the extraction of two more teeth, and who died twelve days after of hemi-

plegia and subacute bacterial endocarditis. In reviewing 40 cases of this disease admitted to Guy's Hospital between 1922 and 1927, he finds 7 of these had gross dental sepsis, and 7 dental sepsis of a lesser degree. In those cases in which cultures were made from the teeth there was no corresponding positive blood-culture. He then records two cases in which extraction of teeth appeared to have some relation to the onset of disease. A woman, age 26 years, with no history of rheumatism, but who had suffered for seven years up to four years previously from swollen and painful ankles, dated the onset of her illness, which proved to be subacute bacterial endocarditis, from the extraction of a molar tooth one year before death. In this case no chronic periodontal infection or apical abscesses were found. Another case, a man of 47 with mitral stenosis and regurgitation, had four teeth extracted, after which the temperature rose on the third day to 102.6° and persisted. Four weeks after the blood was positive—*Streptococcus viridans*—and he died in six months. Another case is related of a boy of 10 who himself removed some septic teeth and after a month showed symptoms which ultimately developed into subacute bacterial endocarditis.

H. B. Sprague,² during the observation of 20 cases of subacute bacterial endocarditis verified post mortem and due to *Streptococcus viridans*, studied the production of mitral stenosis in these cases. His conclusions are that as regards measurements of the mitral ring there is no important narrowing at the base of the valve. Vegetations, however, may produce an actual narrowing, and in these cases it is responsible for the production of a mitral diastolic murmur. There was a systolic murmur at the mitral valve in all cases in which this valve was affected. In 9 cases out of 20 there was a mitral diastolic murmur, only one of which, however, was loud.

REFERENCES.—¹*Guy's Hosp. Rep.* 1930, Jan., 39; ²*Jour. Amer. Med. Assoc.* 1930, April 5, 1037.

ENDOCRINE TUMOURS. (See also GOITRE; PARATHYROID GLANDS; PITUITARY GLAND; PITUITARY TUMOURS; SUPRARENAL GLANDS; THYROID GLAND.) *W. Langdon Brown, M.D., F.R.C.P.*

Following the observations and collected cases of Parkes Weber on this subject, we may refer to a case reported by Putnam Lloyd¹ in which tumours were found in the pituitary, parathyroid, and pancreas. He suggests that the first stimulated a compensatory hyperplasia in the other two, since the first is opposed to them in action, while they are synergic. R. P. Rowlands and G. W. Nicholson² report the case of a boy of 9 who had a very large swelling of the left testis. He had the appearance of a fully-grown young man of 18 with well-developed sex characters. The swelling was removed by operation and proved to be an adenoma of the interstitial cells of the testes, the seminiferous tubules being empty. When seen two years later there was no retrogression in the signs of puberty. Parkes Weber quotes a case reported by Sacchi in 1895 due to a carcinoma of the left testis in a boy of 9½ who had the appearance of a man in the twenties. Removal of the tumour was gradually followed by disappearance of the physical signs of precocity, while mentally the boy became more childlike. It is increasingly clear that tumours of endocrine glands composed of cells characteristic of such glands may lead to their gross overfunction.

Hyperinsulinism and Pancreatic Tumours.—It is perhaps not surprising that until the isolation of insulin the converse of diabetes was not recognized. Then through the study of blood-sugars it was seen that just as the thyroid defect of myxœdema is the opposite of the thyroid excess of Graves' disease, so diabetes has its opposite in hyperinsulinism. The symptoms of this condition were recognized through their similarity to those produced by an overdose

of insulin. Hector Cameron called attention to the similarity between the nervous symptoms of the child who is liable to ketosis and the child who has had too much insulin. Anyone who has had experience of diabetes in children must be familiar with the outbreaks of uncontrollable temper and other nervous manifestations in the child with too rapid a fall of blood-sugar after a dose of insulin. The child who is liable to ketosis generally has a loathing for fats and a passion for sugar, which is quite comprehensible physiologically. There is no doubt that Cameron is right in claiming that such children are much improved in health and temper by giving them more sugar, as dextrose, and less fat. But minor degrees of such a condition are not infrequent in adults. Graham has pointed out that those individuals who become extremely irritable if kept waiting for food (and who, indeed, does not, if the waiting is sufficiently prolonged?) will be found to have a low blood-sugar at that time. He found that not only a dose of dextrose itself, but a cocktail would raise the blood-sugar, which may account for the vogue of the latter in this nerve-ridden generation—for that a nervous mechanism is at work is very probable. Britton³ and Le Barre⁴ showed that stimulation of the vagus would produce a fall of blood-sugar. The evidence would be more convincing if atropine checked this fall, but it did not. Graham thinks that the hunger pain of duodenal ulcer and other hyperchlorhydric conditions is in part due to low blood-sugar. This is comprehensible, since hunger is accompanied by contractions of the stomach produced through the vagus, and Pavlov proved the influence of the vagus in exciting a secretion of the acid of the gastric juice, while Cathcart in 1911 showed that vagus stimulation would excite activity in the pancreas. It may well be that a low blood-sugar is one of the normal excitants of hunger, since it would thus directly lead to its own correction.

But apart from this normal mechanism which may be exaggerated under certain nervous conditions, there are now cases on record where tumours of the pancreas have led to a dangerous degree of hypoglycæmia. Such a condition was first described by S. Harris in 1924, while in 1926 the Mayo Clinic had an example due to carcinoma of the pancreas originating in the cell islets. Some subsequently reported cases have been malignant, others benign. Wilder, reviewing the position in 1928, pointed out the analogy between tumour of the pancreas with hyperinsulinism and adenoma of the thyroid with hyperthyroidism. Some such cases, if mild, can be relieved by more liberal and more frequent food; sometimes sugar must be given every two hours. But in other instances it may be almost impossible for the patient to ingest enough sugar to keep the blood-sugar at an appropriate level. Some have died, and epileptiform convulsions led to the fatal issue in some of these, recalling at once the hypoglycæmic convulsions from a gross overdose of insulin. **Thyroid Extract** has been given in some cases for its antagonistic effect on insulin, and **Ether Anæsthesia** may alleviate the condition for several days. In severe cases operation must be considered with the object of removing a tumour if present, or of removing part of the gland on the analogy of operation for hyperthyroidism. G. Howland and his colleagues⁵ in March, 1929, successfully removed a tumour from the middle of the body of the pancreas, which proved on microscopic examination to be composed of masses of islet tissue possessing some features of malignancy. No metastases were found, however, and the patient's blood-sugar returned to normal after the operation. In a case of Holman's, one-third of an apparently normal pancreas was removed with some improvement in the symptoms, though the hypoglycæmic tendency persisted. Nevertheless F. N. Allan, W. C. Boeck, and E. Starr Judd⁶ urge that in cases of severe persistent hyperinsulinism a carefully planned removal of a portion of the pancreas ought to be considered. We may conclude that hyperinsulinism,

though rare in its severe forms, is a clinical reality, whether due to an islet tumour or not. (See also DIABETES; SUPRARENAL GLANDS.)

REFERENCES.—¹*Johns Hopkins Hosp. Bull.* 1929, July, 1; ²*Guy's Hosp. Rep.* 1929, Oct., 401; ³*Amer. Jour. Physiol.* 1925-6, lxxv, 291; ⁴*Comptes rend. Soc. de Biol.* 1927, xevi, 196; ⁵*Jour. Amer. Med. Assoc.* 1929, Aug. 31, 674; ⁶*Ibid.* 1930, April 12, 1116.

ENTERIC FEVER. (See PARATYPHOID FEVERS; TYPHOID FEVER.)

EPIDEMIC ENTERITIS.

G. E. Oates, M.D., M.R.C.P., D.P.H.

This term, together with the terms 'zymotic enteritis' and 'summer diarrhoea', is used by epidemiologists to cover a number of conditions. The causation and bacteriology of epidemic enteritis are still obscure, but it would appear that various bacteria may be responsible. The disease, affecting principally infants and young children, was at one time a serious cause of mortality. Even so recently as the year 1914 there were 17.37 deaths per 1000 births from it, but in 1928 the figure had fallen to 6.21 per 1000 births.

ETIOLOGY.—Epidemic enteritis may be classed as a dirt disease and is generally due to infection with bacteria of excremental origin. These bacteria gain access to the alimentary tract of a child who lacks resistance or whose digestive processes may be temporarily disordered. The infection may be in dust or dirt or in food, particularly milk. The disease is more prevalent in those towns where there are privies. Its seasonal incidence is closely related to the seasonal prevalence of house-flies. It is more apt to occur in bottle-fed than in breast-fed infants. The diapers of an infected child are contaminated and potentially dangerous to other children. The most common vector of infection is the house-fly, whose structure and habits are such as to facilitate the transference of bacteria from infected material to foodstuffs.

PROPHYLAXIS.—Prophylactic measures against epidemic enteritis must: (1) Protect the child and its food from dust, dirt, and house-flies; and (2) Be directed against the house-fly and all waste materials upon which it can breed. All cows' milk, unless properly pasteurized, must be scalded and protected from flies and dust. Care should be taken that dirt is not introduced into the child's mouth by its dirty hands, by comforters, or by flies settling on the lips. In hot weather great care should be taken to relieve thirst with water and not with an excess of liquid food, which may cause indigestion. Careful directions should be given to the mother of an infected child. She should cleanse her hands and nails carefully after soiling them. Soiled diapers should be shielded from flies, washed out in water, and boiled. In combating house-flies the local authority can do a good deal. House refuse should be frequently removed, as well as collections of horse-manure. Wherever possible water-closets should be substituted for privies.

In some places epidemic enteritis is notifiable to the Medical Officer of Health. This enables the local authority to provide medical and nursing assistance for the sick child. If possible beds should be available for hospital treatment. Ultimately the prevention of epidemic enteritis lies in the better education of the mother in infant management. In this work the private practitioner, the midwife, the health visitor, and the infant welfare centre all co-operate.

EPILEPSY.

Macdonald Critchley, M.D.

Neurosomatic Deterioration.—Chronic epileptic patients, particularly of the institutional type, at times show a slowly progressive enfeeblement of strength, with the simultaneous onset of rigidity, defects of articulation, and alterations in attitude and gait. There develops in such cases a state which strikingly resembles Parkinsonism. It has been known, too, that epileptic patients may develop these symptoms with some suddenness on recovery

from status epilepticus, tending, however, to wear off after some days. The physical signs in such patients may recall those of Wilson's disease, on account of the added features of pathological laughter and crying. Cases of the former class have been recorded by Urechia, Elekes, and Mihalescu,¹ and also by Toulouse, Marchand, Bauer, and Male.² They were referred to specifically by Courtois³ under the title 'syndrome comitio-Parkinsonien'. A recent detailed study of this type of physical change has been made by M. B. Hodskins and P. I. Yakovlev.⁴ The signs of 'neurosomatic deterioration'—as they call it—in the chronic epileptic consist primarily in a generalized hypertonus of extra-pyramidal type, associated with poverty of movement and a general attitude of flexion. To this 'epileptic Parkinsonism' is added: (1) a progressive bilateral pyramidal type of spasticity, (2) progressive pseudo-bulbar manifestations, (3) a severe paraplegia in flexion with contractures, and (4) advanced dementia. This clinical picture must be distinguished from the evidences of primary cerebral palsies and hemiplegias upon which a chronic epilepsy is so often engrafted.

The 'Hydration Factor' and Treatment by Dehydration.—In the course of a research pursued over a number of years, Temple Fay⁵ has drawn attention to abnormalities in water metabolism as an important predisposing factor in the production of epilepsy. He points out the frequency with which distension of the subarachnoid spaces is demonstrable in epileptics either by means of encephalography or by operative exposure of the brain. A diseased or damaged condition of the subarachnoid pathways, Pacchionian bodies, or the venous drainage is implicated in the pathogenesis of the major seizure, not only in idiopathic epilepsy, but also in the fits accompanying eclampsia, uræmia, and cerebral trauma. The violent convulsive movements are regarded as the 'normal' activity of healthy cortical neurones. Control of this reflex mechanism, and consequently relief of symptoms, is to be sought in: (1) The avoidance or removal of the causative stimulus; (2) The protection of the normal motor controlling (inhibitory) mechanisms; and (3) Interruption of the vicious cycle which surrounds the known factors. It is in this third category that the 'hydration state' plays an important rôle, and control of the patient's water balance will, it is believed, check the number and severity of attacks.

The treatment advocated by Temple Fay consists in reducing the patient's fluid intake to a minimum. This is effected by the following régime. During the first week, while routine neurological and laboratory tests are being carried out, a record is kept of the total daily amount of fluid taken, the exact quantity and nature of the solid foodstuffs, and the total urinary output. When these data are completed, an encephalography is performed, after withdrawal of as much spinal fluid as possible. During the next two or three days the patient is very ill, complains of severe headache, and has no desire for food or drink. Advantage is taken of this fact in order to restrict the fluid intake. The patient is allowed a maximum of 10, 12, or 16 oz. of total fluid in twenty-four hours; those suffering from very numerous seizures are allowed the least liquid. To overcome thirst, the fluid is given in small but frequent doses; white-rock, seltzer-water, lemon-juice, or grape-fruit may be given as an alternative to water; chewing orange peel or gum is permissible. At the end of the tenth to the fourteenth day some adjustment in the intake:output ratio begins to occur, as shown by the amount excreted falling slightly below that taken in; previously the reverse may have held. The patient is now allowed solid foodstuffs, but all of a dry nature. Toast is substituted for bread, baked potatoes for boiled; dry cereal with a measured amount of milk is given instead of cooked grain. All vegetables are drained. Sauces, gravies,

and juicy fruits are not allowed. Foods which tend to excite thirst are banished from the dietary; hence ice-cream, candy, sweets, salt beef, and ham are forbidden. A salt-free diet is not insisted upon, but no salt may be added to the meals.

Under this régime the patient at first loses much weight, but after the third week remains stationary. The improvement claimed in the epilepsy includes a reduction in the number of major fits; a lessening in the duration and severity of each attack; and freedom from a stage of stupor, headache, and vomiting after each fit. Generalized seizures may be replaced by mild focal attacks or Jacksonian fits without unconsciousness; or petit mal attacks may be substituted for grand mal. At the same time there is a marked psychical improvement, whereby the patient becomes more alert, and less irritable and forgetful. Although this diet has been maintained for as long as two and a half years in some cases, Temple Fay has found no evidence of consequent renal damage and no acidosis. It is, however, admitted that the treatment is one causing the patient much distress, and in the case of certain mentally defective epileptics a strict watch is necessary in order to prevent the diet being interrupted.

REFERENCES.—¹*Rev. neurol.* 1927, ii, 99; ²*L'Encéphale*, 1926, xxiv, 808; ³*Thèse de Paris*, 1928; ⁴*Arch. of Neurol. and Psychiat.* 1930, xxiii, 986; ⁵*Surg. Clin. N. America*, 1924, iv, 227; *Arch. of Neurol. and Psychiat.* 1930, xxiii, 920; *Jour. of Nerv. and Ment. Dis.* 1930, lxxi, 481.

EPISTAXIS. (*See NOSE, DISEASES OF.*)

ERYSIPELAS.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—H. B. Cushing¹ states that eighty cases of erysipelas have been treated at the Alexandra Hospital for Children at Montreal during the last five years. The disease was nearly ten times as common in the first year of life as in any other year of childhood. Three groups of cases were distinguished: (1) Facial erysipelas in which there was high fever and delirium, but with a short course and almost invariable recovery; (2) Erysipelas of one extremity, usually the leg, in which the toxæmia was less and recovery was almost always rapid; (3) Erysipelas of the whole body, in which the mortality was very high and the course prolonged and irregular. Children under 1 year almost always developed this form of erysipelas, while in older children the distribution was the same as in adults—namely, facial in 80 per cent, involvement of one extremity in 10 per cent, and of the trunk in 10 per cent.

TREATMENT.—R. C. Eley² treated 33 cases of erysipelas in infants of from 3 weeks to 20 months by **Concentrated Anti-erysipelas Serum**. In the average case 10 c.c. were given intramuscularly on admission and every subsequent day as long as the lesion persisted. In desperate cases the first injection was intravenous and the rest were intramuscular. A few required only two or three doses, but usually six to eight were given before the infection subsided. Of the 33 cases 21 recovered and 12 died, but only 3 deaths occurred among the 19 cases treated within seventy-two hours of the onset. The most constant effect of the serum was the disappearance of toxæmia and improvement of the general condition.

V. de Lavergne, P. Florentin, and H. Gousset,³ as the result of clinical observation and experiments on rabbits, concluded that anti-streptococcal serum or vaccine was quite useless in erysipelas, and that cases treated by local measures exclusively, especially **Picric Acid**, ran as favourable a course and lasted as short a time as those treated by serum or vaccine. Cushing¹ also found that serum treatment was disappointing, and that most benefit

could be obtained from careful nursing and some soothing lotion or ointment. [The reviewer's experience has been that, though occasionally remarkably good results are obtained by injection of anti-erysipelas serum, in the great majority of cases no benefit is derived from its use.—J. D. R.]

S. Krüger¹ has for many years obtained excellent results in the treatment of erysipelas by application of a dressing containing **Alcohol** (96 per cent) 50 parts, **Sublimate Solution** (1-1000) 1 part. In cases in which the skin could not tolerate the sublimate solution a 1 to 1.5 per cent **Solution of Copper Sulphate** was substituted.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1929, xxi, 276; ²*Amer. Jour. Dis. Child.* 1930, xxxix, 529; ³*Paris méd.* 1929, ii, 180; ⁴*Med. Welt.* 1930, 367.

ERYTHEMA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Erythema Exudativum Multiforme.—The etiology of this condition has constituted a problem which continues to exercise the minds of dermatologists. In the first place, the conditions grouped by Hebra under this title form rather a varied clinical picture, and any sharp differentiation into clinical groups is scarcely possible. The number of etiological factors which appear to play a part in the production of these eruptions is large, and of recent years dermatologists have come to look upon the affection as a 'group reaction' which can be produced by a variety of toxins. Among these, considerable attention has been concentrated in recent years on 'focal sepsis'. In a recent paper, however, E. Ramel¹ examines the evidence in favour of this view and can find little to support it. His own investigations have been made with a view to determining the relation of this condition to tuberculosis, this line of work being suggested by the apparent similarity of acute lupus erythematosus, which is by many accepted as a tuberculous condition, with some cases of erythema multiforme. Ramel's investigations have led to some remarkable results. In a paper read before the Fourth French Dermatological Congress (Paris, July, 1929) he was able to report that he had demonstrated, by the method of successive guinea-pig inoculations, the presence of a tuberculous virus in the blood of eight cases of recurrent erythema multiforme, and also in the lesions in two of these cases. In the paper referred to above he has published an additional four cases, in which similar results were obtained by blood inoculations. The blood taken from these cases was inoculated into guinea-pigs; these animals showed no clinical signs of ill health, and were killed approximately three months after the inoculation. At autopsy small inflammatory non-caseating nodules were found in various organs—glands, liver, spleen, lungs—but these when examined microscopically showed no signs of tubercle bacilli. The affected organs were then injected into other guinea-pigs, and this process was repeated to three or four passages. Eventually typical caseating lesions full of tubercle bacilli were developed.

Ramel points out that these findings are likely to modify profoundly the present conception of the general pathology of tuberculosis. The method demonstrates that in the guinea-pig there can exist a benign tuberculosis, characterized anatomico-pathologically by non-follicular lesions. A tuberculous virus, which can determine this type of infection in the guinea-pig, is present in the blood of patients suffering from erythema multiforme who do not present any clinical manifestations of tuberculosis as usually interpreted. This virus does not appear to exist in the usual acid-fast condition, but may take on this form as the result of successive inoculations. Coincidentally with the occurrence of the acid-fast metamorphosis, the virulence of the virus becomes exalted. The matter is one which will obviously require considerable further investigation.

Erythema Elevatum Diutinum.—This is the name given first by Crocker and Williams in 1894 to an eruption of an extremely chronic nature characterized by the presence of red, raised nodules or plaques chiefly on the extensor aspects of the limbs. These lesions develop very slowly, are very persistent, show no tendency to produce ring forms, and eventually involute slowly. The relation of this rare type of case to erythema multiforme on the one hand, and granuloma annulare on the other, has been the cause of much discussion. F. D. Weidman and J. H. Resançon² have made an extensive study of two cases. On histological grounds mainly, the authors see a relationship between this condition and the nodules found in rheumatism, panniculitis, dermatomyositis, erythema nodosum, and the recently described erythema arthriticum epidemicum (Haverhill's disease). They were also able to isolate *Streptococcus ignavus* from the lesions of one of their cases. They conclude that erythema elevatum diutinum is an entity, distinctive clinically and histologically; that it is probably associated with internal infectious states, principally rheumatism, but the possibility of non-rheumatism-producing infections may also be operative. When the condition is typical it is so distinctive that rheumatism can be identified in the case simply on the basis of the cutaneous symptoms, without any reference to the medical history of the case. They also find that some cases of granuloma annulare may have a rheumatic or at least a focal infection basis, as judged from their similarity to certain variants of Aschoff's nodules in the heart and great arteries.

J. Jadassohn, in discussing this paper, expressed the view that granuloma annulare belonged to the group of anergic tuberculous diseases of the skin. Martenstein had found that patients in most instances reacted negatively to tuberculin, but he found anticutines and procutines, and even lesions of the lungs as in sarcoids. In the Kiel clinic tubercle bacilli were seen in the tissue. Jadassohn considered that erythema nodosum might be due to a variety of causes, and that it was possible to differentiate a secondary symptomatic group from a group due to unknown causes. The same might be true of erythema multiforme and purpura. With regard to dermatomyositis, he believed some relationship to scleroderma might exist.

Erythema Nodosum.—J. O. Symes³ reports cases in which erythema nodosum has occurred in several members of the same family. He quotes many instances which point to the infective nature of the disease. He finds the incubation period hard to determine, but that it is usually about fourteen days. The nature of the infective agent is at present unknown: on the Continent the view is widely held that the disease is a modified form of tuberculosis, but in this country and in America it is increasingly regarded as a streptococcal infection. Whatever the organism may be, its activity in all European countries is greatest in March and April, and this groups it with such diseases as pneumonia, streptococcus infection, tuberculosis, and encephalitis lethargica, for which the winter months, by the absence of sunlight, prepare the soil. Infection probably takes place through the tonsils, and it is probable that it is in these organs and in the nasopharynx that it lies dormant for weeks or months. (See also p. 182.)

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1930, Jan., 1; ²*Arch. of Dermatol. and Syph.* 1929, Nov., 593; ³*Lancet*, 1929, ii, 1033.

ERYTHEMA INFECTIOSUM.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—Epidemics of erythema infectiosum or fifth disease are reported by E. H. Smith¹ at Ogden, U.S.A., and by A. Siwe² at Lund. The epidemic described by Smith consisted of fourteen cases which occurred in the autumn of 1927 and spring of 1928. On inquiry it was found

that many other cases had occurred but were incorrectly diagnosed as food rashes or rubella. The slight degree of contagiousness was shown by the fact that the disease rarely attacked all the children in one family, and only a small proportion of the school-children were affected, although many undoubtedly attended the school while suffering from the disease.

The epidemic described by Siwe comprised twelve cases which occurred in a children's hospital, the ages of the patients ranging from 2 to 11. The duration of the disease varied from six hours to seven days or more. The blood-picture presented no pronounced changes. Several patients showed a recurrence of the eruption, though it did not necessarily have the same appearance or distribution as the primary exanthem. In only two instances did the rash assume the typical circinate appearance, and in the others it was more like scarlet fever or measles. As regards complications, one child developed extensive œdema and considerable cutaneous and subcutaneous hæmorrhages, and several other children showed a distinctly increased sensitiveness to tuberculin after the disease.

REFERENCES.—¹*Arch. of Pediatrics*, 1929, 456; ²*Monats. f. Kinderheilk.* 1929, xlv, 152.

ERYTHEMA NODOSUM. (*See also* ERYTHEMA.) *Ivor J. Davies, M.D.*

Professor Achard¹ (Paris) reports some rare complications of erythema nodosum. The term includes all the morbid states in which the syndrome of nodular erythema is met with. He is inclined to believe that there is a special infectious disease in which erythema nodosum is associated with constitutional disturbances. Although as a rule a mild affection, it may leave marked debility and pallor behind it, and may be complicated by gastrointestinal troubles, slight albuminuria, and cerebral symptoms, phlebitis, or polyneuritis. Such complications, however, are exceptional, and this fact gives special interest to the two reported cases. One case was complicated by an orchio-epididymitis and the other by a polyneuritis. There is reason to believe that the disease which causes erythema nodosum may in some instances be manifested by other symptoms in the absence of the erythema or with a different eruption, e.g., polymorphous erythema. Treatment of the primary condition consisted in the administration of **Salicylate of Soda** in full doses.

REFERENCE.—¹*Med. Press and Circ.* 1930, June 4, 471.

ERYTHRÆMIA (Polycythæmia Vera ; Vaquez-Osler Disease).

Ivor J. Davies, M.D.

H. Avery¹ (London) describes a case in which polycythæmia rubra vera of several years' standing passed into an anæmia resembling pernicious anæmia. **Liver Treatment** resulted in a marked improvement in the blood picture, but the patient died of an intercurrent polyserositis. Marked hæmatopoiesis was seen in the bone-marrow.

TREATMENT.—G. Milani² (San Francisco) reports two cases of Vaquez's disease (erythræmia) in which good and apparently lasting results were obtained by irradiation of the long bones with **X Rays**. He states that the favourable result of this therapy brings a clinical contribution of great value to the pathogenesis of this disease, because it shows clearly that the element responsible in the hæmatological and clinical picture of the disease is the marrow of the long bones, on which the unknown etiological factor acts almost exclusively, and it indicates the method to be followed in the treatment of polycythæmia. It is evident from this report that this method of treatment must be well applied and accurately supervised.

REFERENCES.—¹*Lancet*, 1930, i, 342; ²*Jour. Amer. Med. Assoc.* 1929, Oct. 19, 1205.

EUGENIC STERILIZATION.*Henry Devine, M.D., F.R.C.P.*

The Report of the Committee for Legalizing Eugenic Sterilization¹ is a document of considerable interest and importance. The whole subject is fully discussed and a number of recommendations are made. In a series of sections the Committee make it their aim to justify the following statements: (1) That much defectiveness is inherited; (2) That defective producing strains, and perhaps also defectives themselves, tend to be more fertile than normal people; (3) That sterilization is harmless, and does not affect the person sterilized in any other way than by abolishing his capacity to procreate; (4) That the present state of the law demands that sterilization be legalized; (5) That voluntary sterilization of defectives is in successful operation in other countries; (6) That the measures now in force for coping with the fertility of defectives are inadequate. These various points are discussed serially, and then some of the arguments usually propounded against sterilization are considered and the Committee's proposals set forth.

As regards the Committee's proposals concerning *mental defectives*, the necessity for institutions is fully recognized. It is felt, however, that these institutions, owing to the fact that the managers of them naturally think more of the safety of those already in the institution than the dangers of those outside, "tend to become stagnant pools". The new conception which is strongly advocated is that, while many have to remain in the institution all their lives, the colony of the future should be "a flowing lake of the greatest fluidity, always taking in and sending out". After a suitable defective has been stabilized and trained in the institution and it is proposed to discharge him to guardianship or elsewhere, the whole case record, giving an account of the family history, home conditions, and reaction to life before admission, should be fully reviewed by a suitable Board. If it is thought that there is the smallest risk of the defective's propagating—if, in other words, it is doubted whether the system of guardianship or supervision proposed for him will be adequate to secure his certain non-procreation—then an attempt should be made to persuade the defective to consent to sterilization. To this the Board of Control and the relatives would also have to consent. For various reasons which are stated in the report, it is not recommended that the discharge of a defective from an institution be made conditional upon the consent of himself and his relatives to his sterilization.

As regards the *psychotic patients*, it is pointed out that many of the insane who are discharged as cured from mental hospitals relapse and have to be readmitted. The number of such readmissions averages out at about a fifth of the total admissions to mental hospitals. Since 1924 the numbers of first admissions and readmissions to mental hospitals have been as follows:—

| YEAR | DIRECT ADMISSIONS | FIRST ADMISSIONS | | READMISSIONS | |
|------|----------------------|------------------|----------|--------------|----------|
| | | No. of Cases | Per cent | No. of Cases | Per cent |
| 1924 | 21,303 | 17,086 | 80.2 | 4,217 | 19.8 |
| 1925 | 21,784 | 17,345 | 79.6 | 4,439 | 20.4 |
| 1926 | 21,924 | 17,517 | 79.9 | 4,407 | 20.1 |
| 1927 | 21,893 | 17,468 | 79.8 | 4,425 | 20.2 |
| 1928 | 22,377 | 17,760 | 79.4 | 4,617 | 20.6 |

It will thus be seen that in the last five years about 20 per cent of direct admissions have been cases that have previously been discharged as most of them recovered, but who have relapsed and been readmitted. During the intervals between admissions there is clearly nothing to prevent these individuals

from breeding. For this reason the Committee propose, in the Bill which they are drafting, to include a clause providing for the voluntary sterilization, with due safeguards, of persons about to be discharged from mental hospitals.

Thus the proposals are that sterilization should be *voluntary* in all cases, with the single reservation that a defective of such low grade as to be incapable of giving his consent might, with the consent of his relatives, be sterilized if deemed capable of procreation on his discharge from an institution. Since it is unusual for such low-grade defectives to be thus discharged, it is anticipated that sterilization would only exceptionally be performed otherwise than voluntarily.

On eugenic grounds the Committee think that provision should be made for the voluntary sterilization of persons afflicted with hereditary defect seriously impairing physical health or efficiency. This provision, which would clearly have to be carefully safeguarded to prevent abuses by healthy persons who wish to avoid the responsibilities of parenthood, is intended to sanction the voluntary sterilization of persons who will belong chiefly to the 'social problem group'.

In the Report of the Board of Control² it is pointed out that Denmark has now passed a law permitting sterilization with the consent of the patient or his guardian. This measure, like so much legislation on this subject, is still so recent that no sufficient data are yet available by which to test its results. The Board still thinks that the whole question calls for careful study and scientific investigation, but feels that scientific and impartial inquiry is rendered difficult by the atmosphere of controversy which sterilization excites, and also by the exaggerated claims which are put forward by its advocates. The opinion of the Board is that there are cases in which sterilization might be advantageous, and that, if the claims of its advocates are often exaggerated, the condemnation of its opponents rests on an equally unstable foundation. H. Cox³ points out that the importance of the matter is now being realized throughout the world, and he refers to a resolution passed at the annual conference of the Country Women's Association, held in Perth, "urging the sterilization of the mentally unfit in the interests of the Australian race".

REFERENCES.—¹*Report of Committee for Legalizing Eugenic Sterilization*, published by the Eugenics Society, 1930; ²*Annual Report of the Board of Control*, 1929, pt. i, 55; ³*Sunday Times*, 1930, Oct. 19, 15.

EXANTHEMA SUBITUM.

J. D. Rolleston, M.D.

SYMPTOMS.—Since 1925 H. Willi¹ has seen twenty typical cases of this condition at Zurich in children of from 6 weeks to 4 years, the age most affected being from the sixth to the twelfth month. The disease appears to be closely related to influenza owing to the similarity of the blood-picture. Moreover, during an outbreak of exanthema subitum in the Children's Clinic at Zurich numerous patients developed coryza and fever, but without a rash, and were diagnosed as cases of influenza. The identity of the two diseases, however, cannot be established until the causal organism is identified.

D. Teitel² reports nine cases in children of from 9 months to 2 years which he has seen in his practice in Palestine during the last two years, with the characteristic triad found in the cases which have been described in the United States, Japan, Switzerland, Hungary, Germany, and Russia—namely: (1) Sudden rise of temperature without any prodromes; (2) The appearance of a morbilliform eruption immediately after the fall of temperature; and (3) Disappearance of the eruption without leaving any desquamation or pigmentation.

REFERENCES.—¹*Schweiz. med. Woch.* 1929, 953; ²*Arch. Méd. Enf.* 1929, 327.

EXOPHTHALMIC GOITRE. (See GOITRE; THYROID GLAND.)

EYE AFFECTIONS. (*See also* CONJUNCTIVA, DISEASES OF; CORNEA, DISEASES OF; GLAUCOMA; RETINAL DETACHMENT.)

W. S. Duke-Elder, M.D., F.R.C.S.

Radium in Intra-ocular Malignant Tumours.—It is generally accepted that the only safe treatment for malignant tumours of the eye is excision of the eyeball at the earliest possible date. There are, however, cases wherein this may be difficult, as witness a sarcoma in the only eye of a one-eyed man, or a bilateral glioma in a child. If a less radical mode of treatment in such cases were to hold out any hope of success, it would be of the utmost value; and within the last year R. Foster Moore¹ has suggested and applied a technique of inserting radon seeds directly into the tumour in the eye which may prove to be of the greatest value. He describes two cases at length. The first was of a man, age 65, who had a large choroidal sarcoma in one eye, the other eye being blind, and who refused excision. A radon seed of 1 millicurie strength with 0.5 mm. platinum filter was inserted into the middle of the growth and allowed to remain in for fourteen days; three and a half months later a second seed of 5 millicuries strength with 0.5 mm. platinum filter was inserted and allowed to remain ten days. After the first insertion the tumour shrank a little, and after the second very considerably, to about a quarter of its original size; and a year after the first insertion the eye appeared to be quiet and the growth seemed to have shrunk. The second case was of a glioma in a child in whom one eye had already been excised for the same condition. A seed of 3 millicuries strength was inserted and left in for ten days, with the result that the growth largely disappeared. The technique suggested is as follows: A conjunctival flap is thrown back so that the sclera is exposed opposite the region of the tumour, and at a point estimated to correspond to the centre of the growth a narrow von Graefe knife is inserted through the sclera and pushed straight into the globe. The knife should be of such a breadth as will make a hole just large enough, and no larger, to admit the seed without any form of introducer. Bleeding is moderate, but is soon stopped. The seed with an attached black silk thread is then taken with a pair of finely ribbed forceps and is inserted straight into the growth along what is judged to be the track of the knife. Its hindmost end is pushed just within the sclera, the attached silk is cut to a length of about half an inch, and the conjunctival flap replaced in position. An ophthalmoscopic examination should show no change in the eye, but an X-ray picture can be taken to verify the position of the seed. The removal of the seed is an easy matter: the conjunctival flap is again dissected back and the seed removed without difficulty by traction on the silk thread. Two complications have occurred. In the first case mentioned a certain degree of iritis and a posterior polar cataract developed; and in the second a considerable area of vitreous over the region of the tumour became cloudy as if it were coagulated.

It is to be remembered, of course, that neither of the case-histories is long—the longest being just over a year; nevertheless the method holds out some hope of a possible expedient in the treatment of one of the most difficult conditions which can arise in the whole of medicine.

REFERENCE.—¹*Brit. Jour. Ophthalmol.* 1930, xiv, 145; *Proc. Roy. Soc. Med.* 1930, xxiii, 475.

FACIAL PARALYSIS.

Geoffrey Jefferson, M.S., F.R.C.S.

TREATMENT.—The reader will already be familiar with the methods of dealing with facial paralysis due to irremediable damage to the VIIth nerve by anastomosing to it either the hypoglossal or spinal accessory nerves. These nerve-crossings give disappointing results, for not only is the functional result

meagre as far as it concerns the facial musculature, but the additional disabilities caused by the sacrifice of the donor nerve are irksome to the patient. In addition, the technical difficulties of the anastomosis are sometimes so great that a really satisfactory suture without tension and with nerve-ends of about equal diameter is not to be obtained. For this reason recourse has been made to non-nervous means of improvement of the facies of these patients—mechanical means such as the use of fascial strips, of silk strips and stays, of transplants of masseter and temporal muscles, and the like.

W. O. Lodge¹ suggests the use of fascia, a long strip cut from the ilio-tibial band in the usual manner, inserted through a small incision in the anterior temporal region and carried with a packing needle along the lower eyelid through the muscles of the face, first to the internal palpebral ligament, where a second small incision allows the strip to be slung round that ligament, then through the cheek to the angle of the mouth, where the strip is looped round the orbicularis oris (third small incision), and finally back and out of the original temporal incision. The tension is adjusted, best to over-correction, and the wounds are closed. Photographs of the result are not given. Blair² advocates a very similar but rather more elaborate procedure. He points out that the disfigurement of a facial paralysis is not entirely due to loss of muscle movement on the paralysed side, but also to the drooping caused by gravity and the overaction of the normal side. Blair uses strips of tendon which he runs in carefully planned directions through the cheek. His paper is well illustrated and the figures give a good idea of the procedure and the results obtained. They seem to be satisfactory, but not of course perfect. They show that the face is no longer overbalanced by the pull of the muscles of the normal side, and on the whole there is very distinct improvement in appearance. W. Rosenthal³ also discusses the treatment of enduring facial palsy. He is an upholder of the method of transplantation of portions of the masseter and temporalis muscles, the one into the orbicularis oris, the other into the orbicularis palpebrarum. This idea has been described and used in England, and by Lexer in particular in Germany. Rosenthal sees in it something more than the purely mechanical effect with which it is generally credited. In fact, he calls the method one of neurotization of the paralysed muscles—that is to say, he believes that if the donor muscles are carefully dissected so that their nerve-supply from the motor branch of the trigeminal is not interfered with, these latter nerves will grow into those of the denervated facial muscles and neurotize them. This idea of the permeation of nerve-fibres into muscle has long been an attractive theory, and it must be admitted that there is some evidence that nerve growth of this kind can occur. But nerve-fibres will only escape if they have been cut, and will only enter muscle by nerve-sheaths between the muscle bundles; they will not permeate muscle unless they can find neurilemma sheaths to grow along. It follows that raw muscle surfaces must be in contact before neurotization can take place; the orbicularis muscles must therefore be exposed, dissected free of fat, and their surfaces shaved to open the muscle spaces and, it is hoped, neurilemma sheaths. Unfortunately the photographs which Rosenthal publishes are not very striking, but the method is well worth a trial. If it failed, it would be possible to employ the fascial sling methods later. In general no surgical treatment will be employed until a year at least has elapsed since the injury and no sign of recovery is discernible.

REFERENCES.—¹*Brit. Jour. Surg.* 1930, Jan., 422; ²*Ann. of Surg.* 1930, Oct., 694; ³*Deut. Zeits. f. Chir.* 1930, March, 261.

FÆCAL TUMOURS. (See RECTUM AND SIGMOID, STERCOLITHS OF.)

FASCIAL GRAFTS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Free fascial grafts have been used in selected cases for a number of years in connection with operations for the cure of hernia. Some controversy has arisen as to whether fascia will unite with muscle after these operations. The probability is that a re-implanted piece of fascia lata remains alive in an unaltered condition. This was shown by Gallie and Le Mesurier, and as a result of their work the fascia suture in hernia repair has become largely and successfully adopted.

Some authorities hold that the transplanted fascia is not preserved as such, but is gradually replaced by fibrous tissue which closely resembles the fascia. This matter is (like the bone-graft controversy) only of academic interest. S. L. Haas¹ discusses many of these points, and summarizes his investigations by saying that muscle will unite with transplanted fascia, that the transplanted fascia seems to engage actively in the process of union, and that there is some evidence that the muscle cells may undergo a fibrous transformation and share in the union.

$\frac{1}{4}$ Sc

FULL
SIZE



Fig. 9.—Instrument for cutting strips of fascia lata.

Figs. 10-13.—Method of obtaining strips of fascia lata through a single small incision.

Fig. 14.—Strip of fascia twisted round shank of fascia cutter.

(Figs. 10-14 reproduced from the 'Lancet'.)



Fig. 10.

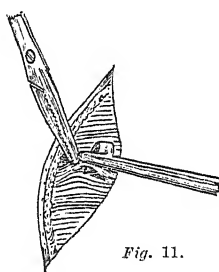


Fig. 11.

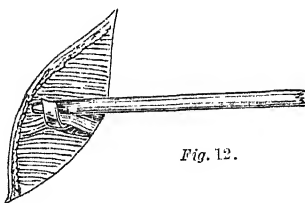


Fig. 12.

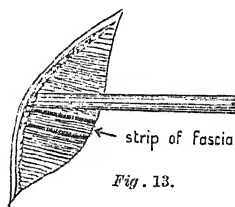


Fig. 13.



Fig. 14.

T. J. D. Lane and T. A. Austin² describe new instruments for obtaining fascial sutures which were devised at the Meath Hospital, Dublin. The first instrument is a cutter for obtaining strips of fascia lata subcutaneously through a single small incision. The cutter, as originally designed by Stokes, necessitated two incisions. A short one was made on the outer side of the thigh about a hand's breadth above the knee. The fascia being exposed, two parallel incisions $\frac{1}{4}$ to $\frac{1}{2}$ in. apart were made in it, and the strip was freed at its distal end. This strip was then threaded through the tubular cutter and the free end held by an artery forceps. The cutter was pushed subcutaneously straight up the thigh in the line of the fascia lata. When it

reached the desired height a small incision was made down on the point. The fascia was cut free at the proximal end. The tube and the strip of fascia were then withdrawn.

The instrument as modified by Lane and Austin can be used with only one skin incision. It is, in the main, an open ring or horseshoe-shaped knife with the cutting edge on the distal end, blunt at the proximal end, fixed on the end of a 10½-in. steel stem (*Fig. 9*). An incision 1 to 1½ in. long is made on the outer side of the lower end of the thigh, 2½ in. above the knee. The fascia is laid bare and is dissected free of fat for an inch or more. It is picked up with a forceps (*Fig. 10*), and the sharp free edge of the cutting hook of the knife is pushed round the base of the ridge so formed (*Figs. 11, 12*). The distal end of the strip thus isolated is seized with an artery forceps and held taut while the hooked knife is pushed in the line of the fascia up the thigh as far as it will go (*Fig. 13*). A rotary movement of the instrument on the fascia strip, which is still held taut, will generally sever it from its connection. If this manœuvre fails to sever the upper fascia connection, the knife should be withdrawn and the strip re-threaded below and given one twist around the shank of the instrument (*Fig. 14*). The knife is now advanced to the top of the strip again. The strip is held taut and the knife is pushed obliquely upwards so as to make an angle of about 20° to 30° with the strip. This brings the cutting edge of the knife across the fascial fibres. This instrument has a more general advantage than the tubular form first mentioned.

REFERENCES.—¹*California and West. Med.* 1930, June, 387; ²*Lancet*, 1930, i, 622.

FAT NECROSIS OF BREAST. (*See BREAST, FAT NECROSIS OF.*)

FAVUS. (*See SKIN, FUNGUS INFECTIONS OF.*)

FIFTH DISEASE. (*See ERYTHEMA INFECTIONOSUM.*)

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

An interesting filariasis survey of a Madras town is recorded by H. H. King¹ and his three Indian assistants, in which nearly the whole population of selected areas was examined for filarial disease by means of house-to-house visits, and evening blood slides of about 25 per cent of the people were examined by the thick-film method for filarial embryos. Among 1664 persons 108 cases (6·5 per cent) of filarial disease were found, 85 of which were elephantiasis and 16 enlarged glands, and 16·3 per cent had microfilariae in their blood, the latter being independent of age, but the incidence of elephantiasis and other filarial affections increased with age owing to repeated chances of infection. No less than 35 per cent of *Culex fatigans* caught in the houses were found to be infected with filaria, and cement drains and pits were the chief breeding-places, while there was a close relationship from house to house between the numbers of human and of mosquito infections. Local differences were associated with mosquito density and with occupation, for those engaged in work involving most damage to the lymphatics—such as dhobies standing for long in water, weavers using their legs much, and shopkeepers sitting for hours with their legs crossed—suffered most, and the womenfolk of clerks and skilled labourers least. Men suffered rather more than women except in the case of elephantiasis in those over forty years of age. Captured recently fed *C. fatigans* contained human or bovine blood, mostly the former, but no avian or reptilian blood, while dogs and cattle were found free of filaria, so man appears to be the source of infection. S. Sundar Rao and M. O. T. Iyengar² have studied the effect of season on the development of *Filaria bancrofti* in *C. fatigans* fed

on filarial cases at the Calcutta School of Tropical Medicine, and they found the high temperature and humidity of the monsoon period to be most favourable to the process, with full development in 11 days, but in the winter months the infection-rate was low and 18 to 20 days were required for development, although artificial high temperature and humidity during the winter caused rapid development. T. C. Boyd² has found the cholesterol content of the blood to be raised to an average of 0.146 per cent against a normal of 0.116.

H. W. Acton and S. Sundar Rao⁴ write on the phenomenon of 'kataphylaxia', or "a localized failure of the tissue defence mechanism, without involvement of the similar tissues in other parts of the body", as seen clinically in filariasis. In a lengthy discussion the distinction between this local condition and 'anaphylaxia' or allergy, with a generalized sensitiveness to certain circulating protein poisons, is brought out, and kataphylaxia in filariasis is shown to occur either as a lowered resistance of the mesoblastic tissue defence owing to irritation of filaria or as hypertrophy of the epidermis of an epiblastic type. The same workers⁵ record a case of filarial abscess containing a hæmolytic streptococcus, in which the same strain was isolated both from the urine and from a focus of infection in the teeth of the same patient, indicating its origin. A further paper by these workers⁶ records seven cases of urticaria due to a filarial toxin, in which other causes were excluded by appropriate tests. S. Sundar Rao⁷ records having found over a dozen specimens of adult *Filaria* (*Wuchereria*) *bancrofti* in Calcutta cases, mostly in abscesses and in dilated lymphatics.

G. C. Low and D. S. Dixon⁸ record four cases of elephantiasis treated by protein shock with negative results. S. Bergsma⁹ describes incisions to make use of the normal skin, which has been dragged down over the tumour from the pubic and subpubic regions, to form penile and scrotal flaps to cover the external male genital organs at the time of the primary operation. J. Suarez¹⁰ reports bacterial infection, mostly with hæmolytic streptococci, in sixty-five cases of lymphangitis-elephantoid fever.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1929, Oct., 406; ²*Ibid.* 1930, Jan., 759; ³*Ibid.* 949; ⁴*Ind. Med. Gaz.* 1929, Nov., 601; ⁵*Ibid.* 631; ⁶*Ibid.* 1930, March, 130; ⁷*Ibid.* Sept., 481; ⁸*Lancet*, 1930, i, 72; ⁹*Amer. Jour. Trop. Med.* 1930, May, 199; ¹⁰*Ibid.* 183.

FINGER-NAILS, SPLIT.

Sir W. I. de C. Wheeler, F.R.C.S.I.

W. W. Carter¹ discusses the treatment of this minor but troublesome condition. A split finger-nail has no tendency to recover spontaneously. It arises from (1) defects in general health, (2) trauma. The condition may give rise to much pain and disability, especially if the matrix is involved.

OPERATIVE TECHNIQUE. — *Fig. 15* illustrates the method of procedure. The technical details are as follows: Assuming that we have a simple split of traumatic origin reaching nearly to the base of the nail, the patient is instructed to keep the end of the finger well bandaged and protected until the nail has grown three-eighths of an inch beyond the finger. When this has occurred, he is to return for treatment. With a fine drill, three equidistant perforations are made through the nail on either side of the slit beyond the finger. Very fine, strong elastic

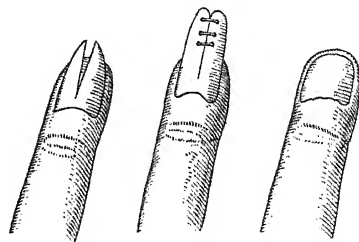


Fig. 15.—Showing method of procedure in treating split finger-nails. (Re-drawn from the 'Medical Journal and Record'.)

treatment. With a fine drill, three equidistant perforations are made through the nail on either side of the slit beyond the finger. Very fine, strong elastic

sutures, such as Bauer & Black 000, are then passed through corresponding perforations and tied, after the edges of the slit have been drawn as close together as possible. The finger is then bandaged for protection. The nail-producing cells of the matrix, exposed between the edges of the slit, should be preserved and protected as much as possible; so even if there is some protrusion of the matrix, this should not be pared off, for it has been found that as the edges of the slit are drawn nearer and nearer together, they override the intervening matrix. This is an important point in the operation, for if matrix is destroyed, perfect nail growth cannot be expected. As the nail, in growing, protrudes the distance between two of the sutures, the distal end is pared and another suture placed near the end of the finger. This process is repeated until the slit is closed, the normal nail is well beyond the end of the finger, and there is no further tendency of the nail to split. In an average case recovery is slow and is not complete until from twelve to sixteen weeks have elapsed.

REFERENCE.—¹*Med. Jour. and Record*, 1930, June 18, 599.

FLAT-FOOT. (See FOOT, SURGERY OF.)

FOOD AND THE PUBLIC HEALTH. (See also DENTAL CARIES; UNDULANT FEVER.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

Food Poisoning due to Eggs.—W. M. Scott¹ states that during the past three years or so there have been seven outbreaks of food poisoning in this country in which circumstantial evidence pointed to ducks' eggs as the cause. It is possible for eggs to become infected with organisms of the salmonella group in three ways. Infective material may be introduced into the oviduct during copulation, with infection of the albumen as it is being deposited round the yolk. Foreign bodies introduced in this way, such as straws and stones, are occasionally found. Ducks frequently copulate in filthy water. Secondly, it is possible for a general infection of a bird with a salmonella organism to be transmitted to the egg. The third way is that of infection through the shell from contaminated material. This possibility can be easily substantiated experimentally, and it is probably the most common mode of infection. Domestic ducks lay their eggs in a casual fashion, often in the mud of ponds and ditches, and opportunities of contamination are considerable. Fowls usually lay in dry surroundings. In view of the large number of ducks' eggs which are consumed, food poisoning from this source must be a rarity, but should not be overlooked. Solitary cases of food poisoning are frequently regarded as acute gastro-enteritis, and it is only when several cases occur that food contamination is suspected. The egg is the commonest dish in ordinary life which is unshared with other persons.

Vitamin D in Foods.—Vitamin D, or the antirachitic factor, is now thought to be identical with the chemical substance ergosterol after it has been activated by the ultra-violet range of radiation between 265 and 315 $\mu\mu$. Activated ergosterol has been identified in nearly all foodstuffs which exert an antirachitic action. It can also be supplied to the body in small amount by exposing the skin to ultra-violet radiation, the source of which may be natural sunlight or ultra-violet light generated from an artificial source. M. Mellanby² has established the important fact that vitamin D is a factor in the production of normal enamel and dentine, such as will resist dental caries. In the light of this new knowledge the methods of preventing rickets and dental caries in young children are being widely discussed. The foodstuffs which normally contain vitamin D, such as milk and butter, are variable as regards their content, and therefore unreliable. Egg-yolk is a good source, but for those who can take it cod-liver oil is the richest source. Cows' milk can be enriched

in vitamin D by irradiation, and is now on sale in this form. So, too, dried milk can be readily mixed with a vitamin D extracted from cod-liver oil. Finally, irradiated ergosterol is now available in several preparations of standardized strength.

The fact that certain deficiencies as regards vitamin D in the diet can be counteracted by subjecting the skin to irradiation has led to a widespread use of ultra-violet light from artificial lamps. The Medical Research Council in their report for 1927-8 severely criticize the excessive use of ultra-violet light from artificial sources in the prophylaxis and treatment of disease. The Report states that prolonged researches give no scientific reason at all to suppose that the treatment of rickets, or the supply of vitamin D to the body for any other purpose, is better effected by ultra-violet rays falling on the skin than by the direct provision of vitamin D in the food-supplies.

Vitamin Content of Honey.—Fresh uncooked foods are usually rich in vitamins, but no proof has ever been furnished that honey is anything more than a pleasant but rather costly carbohydrate foodstuff. E. Hoyle³ has tested a fresh English comb honey and a West Indian granular honey and found both to be deficient in vitamins A, B, B₂, C, and D. The deficiency is natural and not due to treatment or storage.

Botulism.—W. Levin⁴ records an outbreak in the U.S.A. where four persons ate canned beet. The beet had been prepared six or eight months previously, and had been subjected to three hours' boiling. Of the four persons involved, one died. Laboratory examination showed *Bacillus botulinus* to be present in cultures. Guinea-pigs fed with the solid beet and the juice from the beet both died. A hen fed with the same was not affected.

Botulism is a rare disease in Great Britain, but the occurrence of such outbreaks as that which caused the death of eight persons at Loch Maree, in Scotland, in 1922, should put us on our guard. The bacillus and its spores are widely distributed in nature. It is an inhabitant of the soil, and by soil contamination food may become infected, particularly fruit and vegetables. The bacillus will only grow in the absence of air, and provided a temperature of at least 68° F. is maintained toxin is formed. Botulinus toxin may be formed in an animal or vegetable medium and is of the most deadly virulence. It is not readily produced in foodstuffs, but tinned products which have been contaminated and then kept warm afford a suitable medium for toxin formation. It is fortunate that the toxin is destroyed at a temperature of 175° F., and to bring any food up to boiling-point minimizes the possibility of danger from the toxin. It is equally unfortunate that botulinus toxin is a notable exception to the rule that bacterial toxins are destroyed by the digestive juices. Toxin formation in tinned products is generally accompanied by spoilage, but not always of sufficient amount to warn the consumer.

Man is extremely susceptible to botulinus toxin; death is reported to have occurred after eating one half of an olive only. The first symptoms occur within twenty-four hours or so, with disturbances of vision, diplopia, third-nerve paralysis, ptosis, and weakness and paralysis of accommodation. Death usually results in four or five days from cardiac or respiratory failure. No remedy is of any value in the treatment of botulism except **Botulinus Antitoxic Serum**, which must be given early in the disease. Suitable supplies of this antitoxin are kept at the Ministry of Health and in the Public Health offices of the larger towns. R. T. Hewlett, W. Bulloch, and R. A. O'Brien summarize our present knowledge of the *Bacillus botulinus* in the third volume of *A System of Bacteriology*, 1929 (Medical Research Council).

REFERENCES.—¹*Lancet*, 1930, ii, 56; ²*Physiol. Rev.*, 1928, viii, 545; ³*Biochem. Jour.*, 1929, xxiii, 54; ⁴*Amer. Jour. Public Health*, 1929, xix, 1246.

FOOT, SURGERY OF.*John Fraser, Ch.M., F.R.C.S.Ed.*

Club-foot.—If congenital club-foot comes under treatment at an early stage it responds remarkably well to manipulation and minor surgical intervention. In a certain percentage of cases—those of undue severity, and relapsing and neglected cases—operation of a more extensive type is indicated. The **Ober Operation** is perhaps the most favoured procedure, and it is fully described in a paper by C. H. Heyman.¹ This method is designed to secure division or lengthening of those structures which are so evidently shortened in congenital club-foot—the deltoid ligament of the ankle-joint, the inferior calcaneal and the scaphoid ligaments, the plantar fascia, the tendo Achillis, the tendons of the tibialis posticus, flexor longus digitorum, and the abductor hallucis.

Access is gained by a median J-shaped incision which begins behind the median malleolus and extends forwards to the tuberosity of the navicular. The flap so outlined is reflected, the deltoid ligament, the thickened astragalo-scaphoid capsule, and the inferio-calcaneo-scaphoid ligament are divided, the tendon of the tibialis posticus is lengthened or divided, and, if a shortened abductor hallucis interferes with abduction, it also is severed. By retraction of the posterior edge of the incision access is gained to the tendo Achillis, which is lengthened.

The operation undoubtedly affords good results in difficult cases. One of the criticisms levelled against it has been in regard to the closure of the wound, which is often a troublesome detail, but the authors point out that it can be overcome by undermining of the edges.

E. D. W. Hawser² is a strong advocate of the **Manipulative Method** of treatment. In the early part of his paper the author states: "Whether congenital or acquired, the unsightly club-foot can be corrected in the child, the adolescent, or the adult without mutilation"; and again, "Almost irrespective of age, the worst type of club-foot can be converted into a normal foot by means of the method here described". These are strong claims and such as must arrest attention. Hawser's methods are purely manipulative. By means of a footboard fastened to the foot sole with semi-elastic bands the deformity is corrected over a triangular orthopædic block. The correction is preceded, when necessary, by fasciotomy and tenotomy, and plaster-of-Paris is used to maintain the corrected attitude. We have not had experience of Hawser's method, but we believe that, if it is possible to control the foot by means of a footboard, a manipulation can be carried out which is possibly more complete and less traumatizing than that produced by a key-wrench. Manipulation, if possible, is undoubtedly preferable to a mutilating tarsectomy.

F. Sauerbruch³ points out that a metatarsus varus is one of the most constant errors in congenital club-foot, and at the same time one of the most difficult to correct. As a means of correction he recommends linear **Osteotomy** of the metatarsal bones through a transverse dorsal incision. To complete the correction of the error it may be necessary to tenotomize the adductor hallucis, the flexor tendon, and the contracted plantar fascia.

Rigid Flat-foot.—The operative treatment of rigid flat-foot is considered by Erich Lexer.⁴ This is a condition for which no really satisfactory operative procedure has been devised, the multiplicity of methods being an indication of this fact. We have such a variety as excision of the navicular (Golding-Bird), excision of the talus (Vogt), excision of the talo-navicular joint (Ogston), a wedge tarsectomy (Perthe), oblique division of the calcaneum (Gleich), and supramalleolar osteotomy (Trendelenburg). None of these various methods has given lasting satisfaction. Lexer describes a new method which no doubt will be tested by those interested in the subject. The operation may be

PLATE XII

FOREIGN BODY IN OESOPHAGUS



Showing tooth-plate in the oesophagus, which had been present two and a half months before the patient sought advice.

described as consisting of four procedures: (1) Osteotomy of the median malleolus and forward displacement of that structure; (2) A wedge-shaped excision of the talo-navicular joint; (3) A shortening of the tibialis posticus tendon; (4) A lengthening of the calcanean tuberosities by incomplete osteotomy and the insertion into the gap of a wedge of bone or ivory. The access required for these details is provided by a median curved incision.

Foot Pain.—Foot pain in childhood is fully discussed by G. Engelmann.³ The article is primarily a condemnation of erroneous footgear, tight stockings, tight garters, badly fitting shoes, and such-like. The author recalls that soldiers of the German Army were relatively free from foot troubles, and attributes their freedom to the method of moulding the boot to the foot, this being achieved by the wearer of new boots wading in water until the leather was thoroughly soaked, and afterwards going on a route march until the boots were once again dry. Certain interesting facts in relation to the mechanism of the foot are brought out. In walking the foot increases in length by $\frac{1}{12}$ to $\frac{1}{10}$ in., and in standing there is a width increase of a similar amount. Important information is given on the question of weight distribution in relation to the height of heel. With a heelless boot the weight on the heel is three times greater than that on the metatarsal heads; with a 3.3 cm. heel the weight at the heel is twice that on the metatarsals; with a 7.5 cm. heel the distribution of weight is equal. It is recommended that children should wear lacing shoes in order to afford ankle support, but for adults the over-strap is to be preferred.

An account is given of the various causes of foot pain, but no new information is supplied. It is recommended that spastic flat-foot be treated by the injection of 5 to 10 c.c. of 0.5 per cent **Novocain** into the body of the peroneal muscles, and if necessary into the extensor group and the tibialis anticus.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1929, Nov., 706; ²*Jour. Amer. Med. Assoc.* 1929, Aug. 31, 688; ³*Deut. Zeits. f. Chir.* 1929, Sept., 283; ⁴*Ibid.* cxxx, 7; ⁵*Wien. klin. Woch.* 1929, Nov. 21, 1505.

FOREIGN BODIES IN THE ŒSOPHAGUS AND BRONCHI.

Sir W. I. de C. Wheeler, F.R.C.S.I.

With the œsophagoscope and bronchoscope foreign bodies recently swallowed or inhaled can be readily removed in most instances. If the foreign body is large or ragged it may require division before removal through the tube. Occasionally a foreign body which has remained *in situ* for weeks or months defies extraction through an illuminated tube. Such cases must be dealt with by open operation, and they are usually referred to the general surgeon. *Plate XII* shows a wedge-shaped dental plate, containing one tooth, measuring $3\frac{1}{2}$ cm. across the base and 3 cm. from point to base. The plate was swallowed two and a half months before the patient sought surgical advice. The denture was lodged just below the suprasternal notch at a level behind the summit of the aortic arch. It had adapted itself to the wall of the œsophagus, so that there was no difficulty in passing the œsophagoscope beyond it, and the patient had no difficulty whatever in taking food—in fact, he was quite unaware of its presence. The inner surface of the plate was covered by granulations, and the actual denture could not be seen with the œsophagoscope. With the œsophagoscope tube in position the œsophagus was exposed as low down as possible. The thyroid gland was retracted upwards, exposing the recurrent laryngeal nerve at the lower end of the wound. The junction of the left innominate, subclavian, and jugular veins was exposed. A finger was passed down behind the sternum by the side of the œsophagus before it was opened. An attempt was thus made to tilt the plate inwards so that it might be seen and seized through the œsophagoscope. This manœuvre failed. The œsophagus

was then opened. The lower pointed end of the plate carrying the tooth was caught by a blunt hook, the plate gently turned round, and the narrow end delivered through the opening in the œsophagus. (The chief danger lies in the possibility of tearing the œsophagus in the ulcerated area and producing a septic mediastinitis, which is almost invariably fatal.) A few stitches were put in the œsophagus and the wound was drained with rubber tissue. A nasal tube was passed into the stomach through which the patient was fed for four days. There was slight leakage when he was given food on the fifth and sixth days, but within a fortnight the wound was completely healed. If the plate had been impacted farther down in the œsophagus, resection of part of the sternum, ribs, and clavicle might have become necessary for exposure, and the danger of septic mediastinitis would have been greatly increased.

A second case ended fatally. During dental extraction under ether anesthesia a tooth was aspirated into one of the lower terminal bronchi of the right lung. It was not discovered for some weeks. Septic lobar pneumonia followed. The tooth could not be visualized with the bronchoscope owing to the constant oozing of pus into the tube. There was a persistent cough without expectoration, and the usual foul smell which is associated with gangrene and abscess of the lung. There was a rapid spread of the gangrenous process. A rib was removed over the consolidated area below the angle of the scapula. The visceral and parietal pleuræ were fortunately found adherent, but the lung was found breaking down, friable, and infiltrated with pus. There was no attempt at the formation of a localized abscess. The lung was freely drained by tubes connected with an electrical aspirator; but, as stated above, the patient died.

These cases illustrate the rôle of the general surgeon in the removal of foreign bodies from the œsophagus and bronchi. In all such cases there should be close co-operation between the skilled bronchoscopist and the operating surgeon.

Many cases of pulmonary abscess have been cured by aspiration with the bronchoscope. (*See also* LUNG, ABSCESS OF.)

FRACTURES. (*See also* MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

E. W. Hey Groves, M.S., F.R.C.S.

Amid all the multiplicity of detail of new appliances and new methods which every year are suggested for the treatment of fractures, it is becoming increasingly evident that two general principles are being relied upon more and more in the conduct of these cases. The one principle is that of axial traction applied directly to the skeleton, the other being the association of plaster fixation with transfixion pins.

Methods of Skeletal Traction.—Although there is now almost universal agreement that fractures with much displacement require traction to be used as the most important element of treatment, yet there remain wide differences of opinion and practice as to the best methods of its application. Within the last few years we have seen the original transfixion pin superseded in many clinics by various types of ice-tong calipers. This change we regard as altogether a change for the worse, because the caliper is neither so efficient as the transfixion pin nor so free from the liability to damage both the bone and the soft parts. The pendulum of surgical opinion, having swung back, then, from tongs to transfixion, has now been engaged by the suggestion that transfixion should be made by a tight wire instead of a rigid pin.

Kirschner's Wire.¹—This method has now so captured the German, Dutch, and Austrian countries, and is so much vaunted in the literature of these countries, that it cannot be passed over as of no importance. Actually the

wire method has been independently introduced by a number of different workers, but as Kirschner's method has been brought to great perfection and is most widely used, his name will probably be identified with the wire traction generally. The wire itself is only 1 mm. in diameter—it may be less—and consists of rustless steel. It is supplied in straight pieces about 30 cm. in length, each piece being sharpened at one end. The wire is gripped in some revolving drill handle, an electric motor for choice. In order to use the long thin piece of wire as a drill it is held in place by a collapsible tongs arrangement which may be best explained by reference to *Fig. 16*. Under a local anæsthetic the wire held in the collapsible tongs is driven right through the limb at one of the ordinary sites of transfixion. The two projecting ends of the wire are then made to engage in the limbs of a stout steel horseshoe, and by a special powerful screw adjustment the wire is tightened to such a tension that it remains straight even when pulled upon by 20 or 30 kilo. applied to the horseshoe attachment (*Fig. 17*). The bone having been fixed by the fine strong

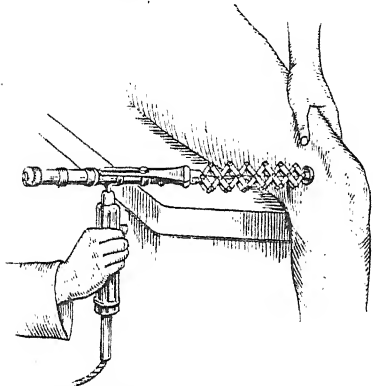


Fig. 16.—Instrument for inserting wire in Kirschner's method.

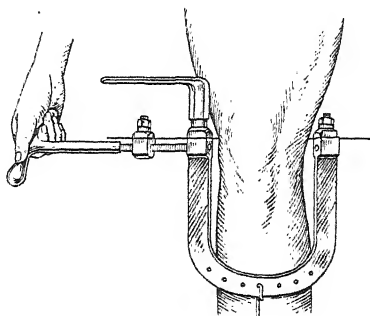


Fig. 17.—Horseshoe attachment for keeping wire rigid.

(*Figs. 16 and 17 re-drawn from Klapp and Bloch's 'Die Knochenbruchbehandlung mit Drahtzügen', Berlin: Urban & Schwarzenberg.*)

wire, held under great tension, the rest of the treatment by traction follows the ordinary lines of skeletal traction, whether by pin or caliper. The advantages claimed by the method are that it produces the minimum of injury both to the bones and soft parts, that it is comparatively painless in application, and that, whilst it has all the efficiency of other methods of skeletal traction, it is not liable to be followed by a sinus. Against it may be urged two criticisms: (1) That if a strong traction force is applied to a fine wire for any length of time, the wire will be liable to cut its way through the bone, especially if the latter is at all atrophied; and (2) That the technique for its application is so elaborate that it is only suitable for use in large hospitals and in the hands of fracture specialists. We are strongly convinced that the skeletal traction represents a great advance, but we are also of opinion that this advance is much more likely to be made by the use of simple instead of highly complicated methods.

Other Traction Appliances.—For a long time now it has been recognized that precise traction work in the treatment of fractures requires the use of special apparatus, by which, whilst a powerful pull is made on the limb, the latter can be held rigidly whilst plaster is applied. Hawley's table was the best known of these devices, and it has been copied, with various minor modifications, by

many other designers. But it is not possible to have a special orthopædic table always at hand in small hospitals or in private houses. Therefore the design of portable traction appliances is a matter of some importance. The best known of these is that devised by Ord, and made by the Medical Supply Association (*Fig. 18*). When put together it is essentially the same as a Hawley's table, but it requires to be placed upon a firm table so as to be of convenient height. It can be taken to pieces and packed in a small case.

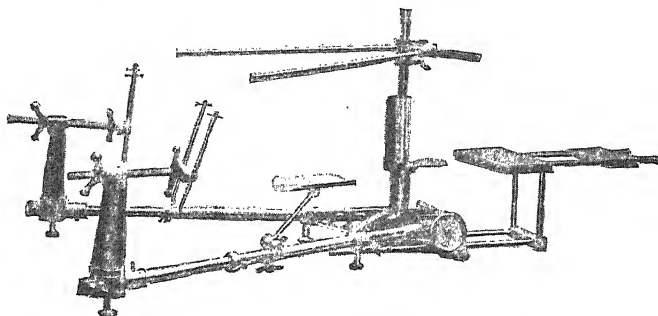


Fig. 18.—Ord's traction apparatus for fractures. (By kind permission of the Medical Supply Association Ltd.)

R. Soutter² has contrived an even simpler form of universal portable traction appliance. It consists essentially of a steel bar 80 in. long with a right-angled piece at one end and a hook at the other. These two ends afford attachment to the traction and counter-traction forces, the former supplied by pulley blocks and the latter by a webbing band. The illustrations (*Figs. 19, 20*) show how this can be applied to any broken limb, but its chief value will be in dealing with the thigh and leg.

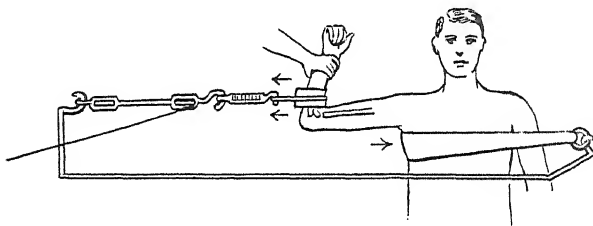


Fig. 19.—Traction on the upper forearm, with the elbow flexed slightly more than 90 degrees: counter-traction on the chest. The pad and the pull should be as close to the elbow as possible. An assistant maintains the flexion of the elbow.

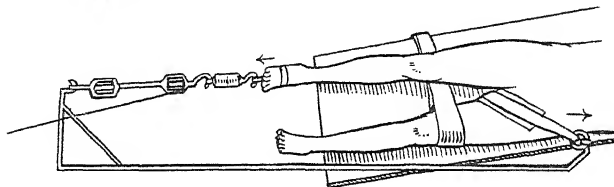


Fig. 20.—Traction at the ankle, counter-traction on the opposite thigh and perineum, which is well padded with a folded sheet. Another sheet is applied to the lower femur on the side of counter-traction, and this sheet is fastened to the operating table, preventing abduction of that leg for fractures of the femur and hip.

(*Figs. 19 and 20 re-drawn from the 'Journal of the American Medical Association'.*)

SPECIAL FRACTURES.

Fractures of the Pelvis.—Injuries of the bony pelvis, like those of the vertebral column, have a completely different character and outlook if they are complicated by wounds of the internal parts. Cases of severe fracture of the pelvis have increased in frequency in recent years, this increase representing a part of the toll of the road. Three papers have appeared lately giving a statistical account of the accident and discussing the treatment and prognosis. C. P. G. Wakeley³ finds his observations upon one hundred consecutive cases, of which somewhat less than half were complete in the sense of breaking the ring of the pelvis across in two places. He draws attention to the fact that there is a very strong ridge of bone in the ilium running from the upper part of the acetabulum to the sacro-iliac joint. The object of this strong bony mass is to transmit the body weight from the leg to the spine. Fractures of the pelvis lie either in front of or behind this bony strut. The commonest type runs through both pubic rami on one side and through the ilium on the opposite side of the body near to the spine (*Fig. 21*). Less common is the type in which the fracture is limited to one side only (*Fig. 22*). Rather more than half the cases do not involve the whole pelvic

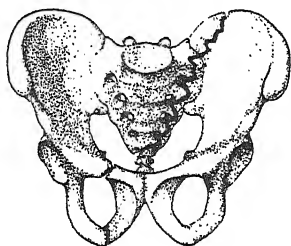


Fig. 21.—Oblique fracture of the pelvic girdle. The lateral part of the sacrum and the upper and hinder part of the ilium are fractured on the left side; the bones bounding the right obturator foramen above and to the medial side are fractured on the right side.

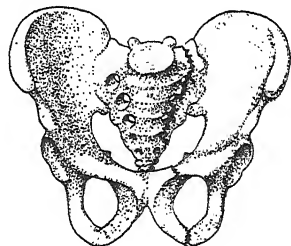


Fig. 22.—Fracture confined to one side of the pelvic girdle. The lateral part of the sacrum, the bones bounding the obturator foramen above and below, are all fractured on the left side.

(*Figs. 21 and 22 by kind permission of the British Journal of Surgery*.)

ring, but only the wing of the ilium, the body of the pubes, or the tuberosity of the ischium. But of these partial fractures those involving the pubes only are just as liable to visceral complications as are the more complete fractures of the pelvic ring. Thus of 100 cases, 11 presented visceral complications, either rupture of the bladder or urethra; 5 of these occurred in fractures of the pubes only, and the remaining 6 were in complete fractures of the pelvic ring.

The diagnosis and the treatment of these cases involve two quite different problems. In the first place there is the urgent problem of recognizing and dealing with rupture of the bladder or urethra. This must be done within the first six hours of the accident, and a difficulty may arise because of the concomitant profound shock which masks retention or extravasation of urine. In all cases, whether of moderate or great severity, a rubber catheter should be passed as soon as possible. If there is any difficulty in this, or if the catheter draws off blood-stained urine, it should be tied in place. If the catheter cannot be passed at all, the choice will lie between perineal or suprapubic section. Where there is obvious retention of urine, indicated by a

distended bladder, it is better to cut down upon the perineum, find the proximal end of the torn urethra, pass a tube into the bladder, and then bring the free end of the tube through the distal end of the urethra. If the urethra is completely divided it may be repaired by one or two deep stitches, leaving the superficial part of the urethra open to the perineum. Where the distinction between the ruptured bladder and the ruptured urethra is not clear, especially in cases of great shock in which there is no distension of the bladder, the line of safety is to make a suprapubic opening. The peritoneum is first deliberately opened, and this may reveal a quantity of blood and urine in the cavity. This will be dealt with on the ordinary lines, clearing out the fluid and repairing the intraperitoneal rupture of the bladder. If the peritoneal cavity is normal, it is sewn up and the extraperitoneal surface of the bladder is examined, opened, and a good-sized tube left in position.

The other problem, that of diagnosis and treatment of the fractured bones, does not present any special difficulty, in principle at any rate. The diagnosis is usually made quite clear by the pain caused on any handling of the bony points, especially on pressing together or apart the spines of the ilium. Details of the diagnosis are of course revealed by the X rays. It is not very clear whether any special method of treatment will greatly affect the rapidity and completeness of recovery; but good treatment may be able to afford a considerable degree of relief from pain to the patient during recovery. The method usually adopted is the use of a divided mattress and a pelvic binder. This may be followed at a later period by a plaster case of the size and shape of a pair of bathing-drawers.

S. W. Boorstein⁴ and also R. Colp and R. T. Findlay⁵ give further statistical studies and deal with the treatment and prognosis of fractured pelvis. In America it is customary to use a Bradford frame, which consists of a steel frame, about the size of an ordinary hospital bed, across which is strained a canvas sheet, with a division or opening for the bed-pan. The prognosis of these cases is a subject upon which there is the greatest divergence of opinion. Probably it is not unfair to say that most surgeons would regard complete fracture of the pelvis as likely to produce complete total disability in labouring men. Some of the American authors, such as L. Noland and H. E. Conwell,⁶ try to persuade us that if these cases are treated on certain lines the prognosis will be just as good as that following fracture of the femur. The principles and treatment which they adopt are as follows: A strong Balkan beam is arranged above the bed, and the pelvis is slung to this by means of a canvas hammock on a metal frame. At the same time weight traction is applied to both the legs. When after four to six weeks early consolidation of the fracture has occurred, massage, movements, and all the resources of physiotherapy are applied to the case.

Fracture of the Neck of the Femur.—This subject was the matter of debate recently before the joint session of the British and American Orthopaedic Associations.

Abduction Treatment.—R. Whitman⁷ presented a summary of his arguments in favour of the universal and routine use of the abduction plaster method which is associated with his name. The value of this method is now so widely recognized that it may be regarded as of the first importance. The author of it lays special stress on the need for the long plaster spica, which if properly put on permits the patient to be turned over on the face within a few days of the accident. He also emphasizes the importance of securing full inversion of the foot before fixing the leg. It is only in this way that the natural rotation outwards of the femur can be corrected, and it is this very outward rotation which is largely responsible for making the fractured fragments fall

PLATE XIII

FRACTURE OF THE NECK OF THE FEMUR

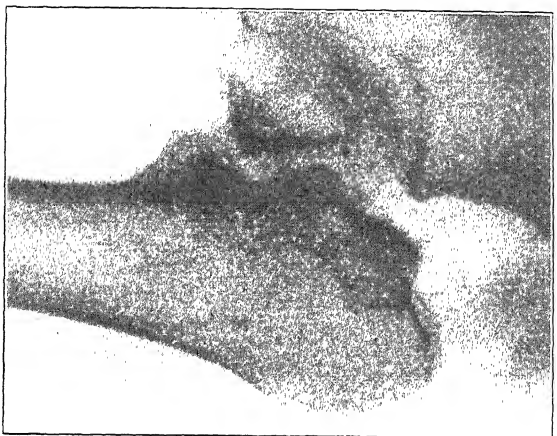


Fig. A.—Fracture of neck of femur in a woman, age 44, two years after the accident. Skelgram showing condition before operation.

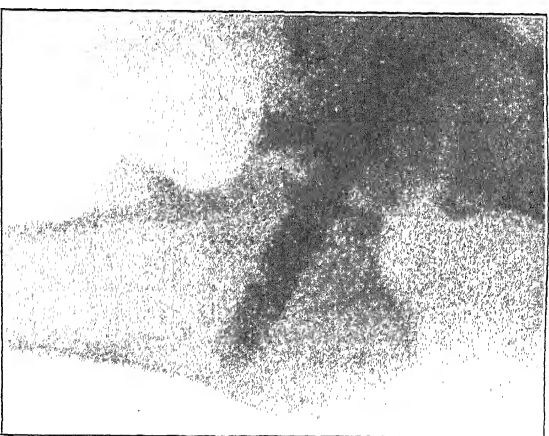


Fig. B.—Same case three weeks after proximal pegging.

Plates XIII and XIV by kind permission of the 'Journal of Bone and Joint Surgery'

PLATE XIV

FRACTURE OF THE NECK OF THE FEMUR—continued

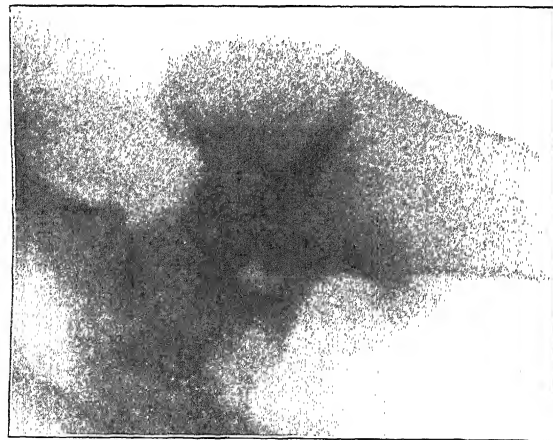


Fig. C.—Same case as *Plat. XIII*, six months after proximal pegging.

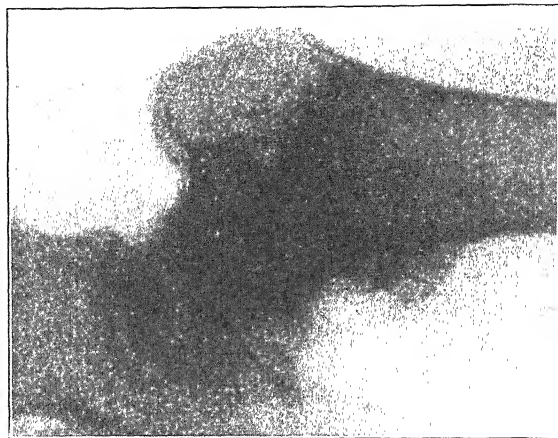


Fig. D.—Same case, eighteen months after proximal pegging.

apart from one another. The attainment of a proper degree of inversion can be at once recognized in the X-ray by the fact that the small trochanter is made to disappear behind the shaft of the femur. We think it is very unfortunate that Whitman cannot give statistics of his results. He is content to quote from a foreign author, who only claims to get 67 per cent successful results. We think, however, that until any authoritative figures are brought forward to prove the contrary we must assume that the Whitman method, even when used by skilled surgeons working in large hospitals, gives only about 60 per cent of good results.

Open Operation.—E. W. Hey Groves^s dealt particularly with two questions—the method of open operation, and the indications for its employment. It is neither possible nor desirable to institute a direct comparison between the Whitman method and that of open operation. Open operation will never be

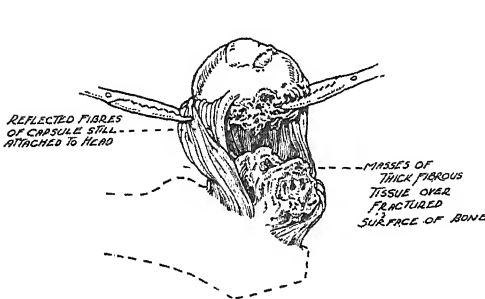


Fig. 23.—The head of the femur has been dislocated, and the reflected fibres of the capsule are shown.

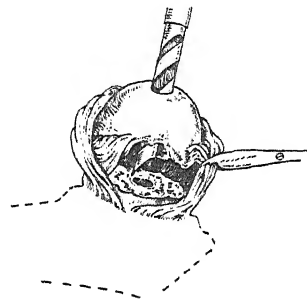


Fig. 24.—The head is drilled to receive the proximal peg.

regarded as the routine method of treatment, because it can only be carried out by those having special experience in hospitals of a certain standard. The important practical point, however, is to recognize when the Whitman method has failed and then to institute the operative procedure. The present practice, however, is only too often to adopt the plaster abduction treatment, and then, if this fails, to give the case up as hopeless or to perform a mutilating operation, removing the head of the bone. In the case of young or middle-aged patients in good general health it is perfectly possible to secure good bony union and good function six or twelve months after the accident by a properly conducted pegging operation. In one case, that illustrated in Figs. 23-25 and Plates XIII, XIV, an absolutely perfect result was obtained as long as twenty-three months after the accident. It therefore may be laid down as a good working rule that the Whitman method should be adopted in all cases of fractured neck of the femur, but that, recognizing that a certain proportion of cases thus treated will fail to unite, the problem must be reconsidered at the end of three or four months, and non-union at this period should be treated by the pegging operation. This will succeed in curing about four out of five of those cases which otherwise end in an ununited fracture. When the fracture is near the head of the bone a much more accurate method of introducing the

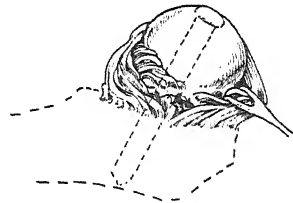


Fig. 25.—The peg in position.

(Figs. 23-25 by kind permission of the 'Journal of Bone and Joint Surgery'.)

peg may be made by driving the peg from above downwards than doing it in the reverse direction. The hip-joint is exposed by the usual Smith-Peterson

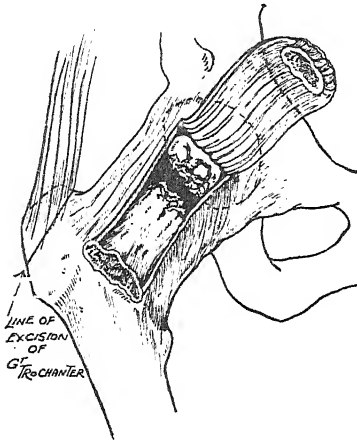


Fig. 26.—Reconstructive operation for ununited fracture of the neck of the femur. The fracture is exposed and a portion of the capsule is turned back by chipping off the tubercle. The atrophied head of the femur is shown.

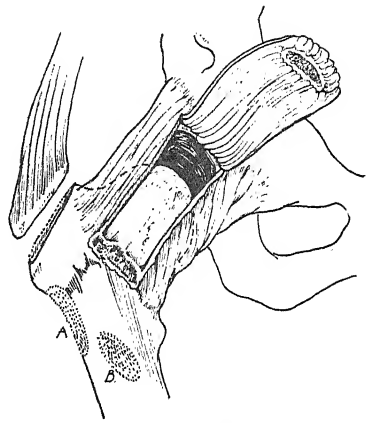


Fig. 27.—The head of the femur has been removed, the greater trochanter excised, and the neck of the femur shaped. A and B are new positions for the greater trochanter and capsule.

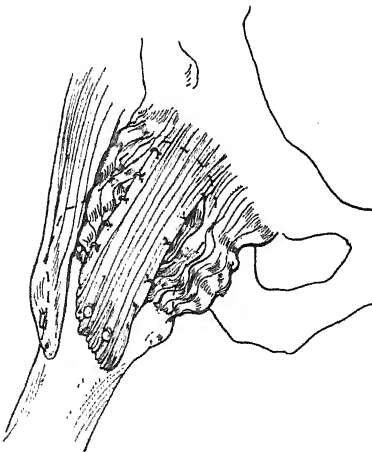


Fig. 28.—The tubercle with attached capsule and the greater trochanter are sutured in lower positions. The rounded neck of the femur has been placed in the acetabulum in abduction, and is maintained in position by the taut portion of the capsule and greater trochanter.

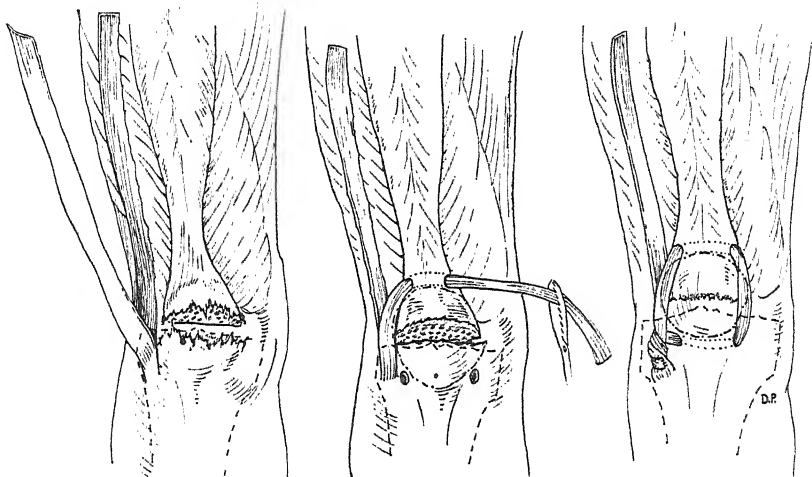
(Figs. 26-28 by kind permission of the *Journal of Bone and Joint Surgery*.)

incision, the capsule of the joint is opened by a T incision, the head of the bone is dislocated from its socket and can then be accurately fitted to the broken neck without tension. A bone-peg $3\frac{1}{2}$ in. long and with a diameter of $\frac{3}{8}$ in. is employed to nail the head on to the neck. The illustrations of this operation are taken from the case of a lady of 44; twenty-three months had elapsed since the accident, and eighteen months after the operation not only was there perfect restitution of the bone, but also such full recovery of function that it was impossible to detect any difference in the movements of the two legs. If at the time of operation it is found that the head of the bone is so atrophied that it will not stand pegging, then a reconstructive operation must be done after the manner first suggested by Whitman. Groves has suggested a modification of Whitman's operation which is designed to prevent the shortened neck of the femur from slipping out

of the socket. This consists in not only shifting the tip of the great trochanter farther down on the femur, but also chipping off the femoral attachment of

the Y ligament and eventually fixing this to the shaft of the femur at a point about an inch and a half below the intertrochanteric line (*Figs. 26-28*).

Fractures of the Patella United by Living Sutures.—The common form of fractured patella due to indirect violence and resulting in wide separation of the fragments should always be treated by open operation, because this gives a much more certain and rapid recovery than any treatment by external splinting. The open operation is generally done by passing a stout metal wire round the patella after removing the fascia which lies between the fragments. This method has given excellent results, but it is open to two drawbacks—namely, the irritation of the wire sometimes causes a sinus, and more often it causes an enlargement of the patella rather in the nature of osteo-arthritis. To overcome these drawbacks it has been suggested that living sutures taken from the fascia lata should be used instead of wire. D. E. Ross,⁹ of Montreal, closely following Gallie's technique, takes a free strip of fascia and passes it backwards and forwards in front of the broken bone, forming a sort of



Figs. 29-31.—Hey Groves's method of repairing fracture of the patella by means of living sutures of fascia lata.

lace suture. It is, however, quite unnecessary to separate the fascial strip from its lower attachment to the tibia. The present writer¹⁰ has shown that a method may be used by which the lower attachment of the fascia lata is preserved and the whole patella surrounded by a strong living suture. A J-shaped incision is made below the knee-cap, and for 8 in. up the outer aspect of the thigh a flap of skin and subcutaneous tissue is turned back, exposing the patella. The fracture is cleared of blood-clot and overhanging aponeurosis. A strip of fascia lata 7 in. long is cut from the thigh, preserving its lower attachment to the tibia; the free end of this strip is pulled through the quadriceps tendon so as to lie on the inner side of the joint. It is then pulled through the tendon below the patella and brought round so as to cross the line of its own origin (*Figs. 29-31*). The fascial strip is sewn in place and the aponeurosis in front of the patella is mended in the ordinary way.

It should be noted that this operation not only provides a strong living fascial suture encircling the whole bone, but also affords a second attachment

of the quadriceps tendon to the head of the tibia. It is thus particularly suitable for those cases of fractured patella with a considerable gap between the fragments, in which, owing to neglect or the failure of a previous operation, some time has elapsed since the accident.

Fracture of the Heel Bone.—It is only of recent years that fractures of the os calcis have assumed a prominent place in surgical literature. This is probably due chiefly to the fact that it was not previously recognized what very bad functional results followed the neglected cases or how these results might be improved by adequate treatment. The injury under consideration is always caused by a fall from a height, the patient landing on his feet. The os calcis becomes broken across the middle of its longitudinal axis and crushed, the heel itself being forced upwards. Thus the longitudinal arch of the foot is broken and the joint between the os calcis and the astragalus is more or less destroyed. Both these fractures will combine to produce as the end-result a very painful form of flat-foot. It is to the work of Cotton in America that we are chiefly indebted for first drawing attention to the importance of active treatment of these fractures, which had hitherto been neglected or merely treated by a plaster case with the foot in plantar flexion. Recently three papers have appeared dealing with the subject, and they give an interesting contrast of methods used in America, Vienna, and France.

O. J. Hermann,¹¹ of Boston, follows very much the lines originally laid down by Cotton. He breaks up the impaction of the comminuted fracture by means of blows of a heavy wooden mallet applied to the outer side of the heel bone. The posterior process of the os calcis is then pulled down by means of tongs so as to restore the longitudinal arch, and the foot is put up in a plaster cast. This is renewed two or three times at the end of ten-day periods. In cases where the pain persists in spite of the fact that the arch has been restored, it is considered that this is due to the disorganization of the joint between the os calcis and the astragalus, and the treatment then advised is a subastragaloid arthrodesis. He claims that by following this method 77 per cent of good results are obtained.

L. Böhrer,¹² of Vienna, attacks the problem in a somewhat similar manner. He depends, however, upon the action of a screw traction applied to the heel through a transfixion pin for the original correction of the displacement and the re-formation of shape of the longitudinal arch (*Plate XV*). In some cases he also uses a kind of screw-press to mould the heel bone into shape.

R. Simon and E. Stulz,¹³ of Strasburg, describe the method devised by Leriche. They regard the breaking of the middle of the os calcis as the essential part of the injury. They call this part of the bone the 'thalamus', i.e., the thickest part of the superior calcaneal cortex which supports the posterior facet for the astragalus. If this is broken across and driven into the spongy part of the bone, these authors believe that proper restitution of the parts can only be effected by open operation. This is done by a curved incision below the outer malleolus, the impacted fracture is broken up, and the main fragments are fixed by one or more metal clips or staples (Dujarrier).

REFERENCES.—¹*Die Knochenbruchbehandlung mit Drahtzügen*, Berlin: Urban & Schwarzenberg; ²*Jour. Amer. Med. Assoc.* 1930, May 17, 1547; ³*Brit. Jour. Surg.* 1929, July, 22; ⁴*Amer. Jour. Surg.* 1929, Nov., 633; ⁵*Surg. Gynecol. and Obst.* 1929, Dec., 847; ⁶*Jour. Amer. Med. Assoc.* 1930, Jan. 18, 174; ⁷*Jour. Bone and Joint Surg.* 1930, Jan., 11; ⁸*Ibid.* 1; ⁹*Canad. Med. Assoc. Jour.* 1930, June, 785; ¹⁰*Proc. Roy. Soc. Med.* 1927-8, 1693; ¹¹*New Eng. Jour. Med.* 1930, April 10, 705; ¹²*Arch. f. klin. Chir.* 1929, Nov., 723; ¹³*Ann. of Surg.* 1930, May, 731.

FRAMBOESIA. (See YAWS.)

PLATE XV

FRACTURE OF THE HEEL BONE

(L. BÖHLER)

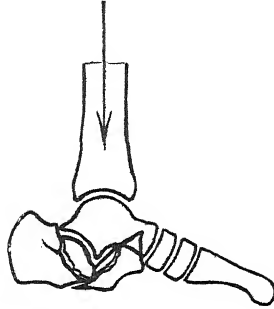


Fig. A.—Diagram to show the way in which fracture of the calcaneum is produced. The weight of the body falling upon the wedge-shaped astragalus causes this bone to shatter the underlying os calcis.

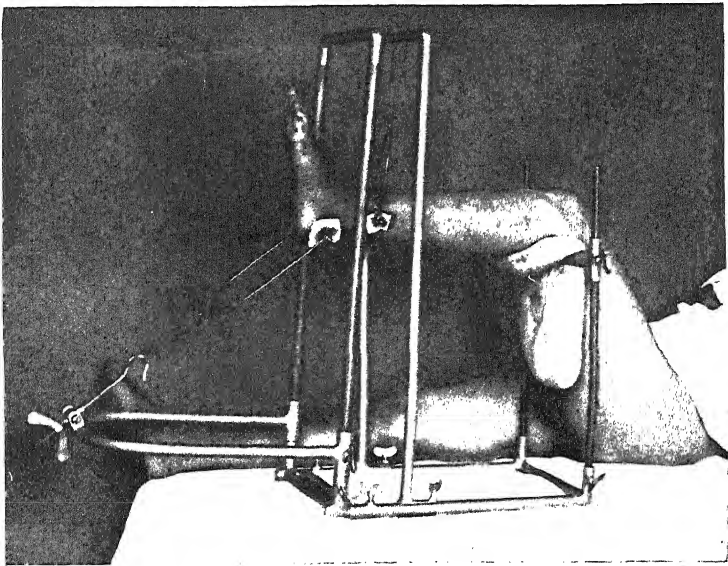


Fig. B.—Arrangement of the screw traction apparatus for the correction of fracture of the calcaneum. Above the ankle a nail is driven between both leg-bones so as to fix the leg. A second nail passes through the insertion of the tendo Achillis, and from this is taken the pull in the axis of the os calcis.

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FRUCTOSURIA. (*See* DIABETES.)**FUNGOUS INFECTIONS OF THE SKIN.** (*See* COCCIDIOIDAL GRANULOMA; SKIN, FUNGOUS INFECTIONS OF.)**GALL-BLADDER INFECTION.** (*See* LIVER, DISEASES OF.)**GALL-BLADDER, SURGERY OF.** *A. Rendle Short, M.D., F.R.C.S.*

PATHOLOGY.—D. P. D. Wilkie¹ emphasizes the important fact that, as the gall-bladder may be the site of a streptococcal infection, it is not uncommonly the source of remote toxic symptoms. He relates cases in which chronic arthritis, myocarditis, nephritis, and even mental derangement have cleared up after cholecystectomy for gall-bladder disease.

K. H. Digby² states that, amongst the Chinese, stones in the gall-bladder are infrequent, but they often form within the liver and are found in the bile-ducts. The symptoms are pain, liver enlargement, jaundice, rigors, and albuminuria. The treatment is to open the common duct and if possible extract the stones, but the mortality is high. A. Gosset, P. Duval, and collaborators³ describe and illustrate intramural stones, sometimes multiple. The treatment is **Cholecystectomy**.

C. F. W. Illingworth⁴ supplies an article on cholesterosis of the gall-bladder, including the 'strawberry' variety. It is usually associated with cholecystitis, and sometimes stones are present. The cholesterol content of the blood may be normal or raised. Symptoms are vague and diagnosis is difficult. The treatment is to remove the gall-bladder. The conclusion is arrived at that the cause is a bile concentrated in cholesterol, associated with an infection of the wall.

According to R. R. Linton,⁵ the coagulation time of the blood is not a reliable test of the danger of post-operative oozing in cases of jaundice. The sedimentation-rate of the blood is a better indication; slow sedimentation means that hæmorrhage is improbable.

Visualization of the Bile-passages.—L. Bérard and P. Mallet-Guy⁶ contribute a valuable paper on the exploration of the bile-passages after a cholecystostomy by X rays and the injection of lipiodol. This is done about three weeks after the operation; a syringe containing 20 c.c. is used, and the fluid is injected gently into the fistula. The skiagram may show the gall-bladder distended or contracted, the common duct patent or obstructed, the hepatic ducts dilated or normal. The method is harmless; the authors have practised it on thirty patients. It is possible by this means to judge whether a persistent biliary fistula is likely to close.

L. Ginzburg and E. W. Benjamin⁷ write to much the same effect. *Plate XVI* is reproduced from their paper. (*See also* X-RAY DIAGNOSIS.)

Cholecystography.—M. Chiray, A. Lomon, and G. Albot⁸ mention the value of rendering the gall-bladder visible by cholecystography, and then testing for the most tender point by palpation, with the patient first lying, then sitting. It may prove that the point of greatest tenderness is, or is not, over the gall-bladder.

G. Levene and L. R. Whitaker⁹ recommend the administration of the dye partly by mouth and partly by the intravenous route, to increase the density of the shadow without increasing the risk of reactions. They then examine with the fluoroscope, and give a barium meal, to watch over a period of time the emptying of the gall-bladder in relation to the movements of the stomach and duodenum. Two-thirds of the estimated dose is given intravenously, and two-thirds of the usual oral dose given by mouth.

E. L. Young, jr.,¹⁰ analysing the accuracy of the Graham test, found that when it showed a positive result there were only 12 per cent proved wrong by operation; when the test gave a negative result, it was correct in 68 per cent, wrong in 32.

Technique.—For the benefit of the inexperienced or occasional surgeon, we give somewhat fully the modern standard technique, as expounded by Digby Chamberlain,¹¹ from Lord Moynihan's clinic. The case is one of stone in the gall-bladder or common duct, and the operation is to be exploration of the ducts and removal of the gall-bladder.

The patient is prepared by giving plenty of glucose both by mouth and per rectum, over several days. The anæsthetic is gas-oxygen, with a little ether at the deepest stage of the operation. The incision is a right paramedian, and a support is placed behind the lower ribs. [We prefer no support, as it renders the muscles tense. We use Sloan's incision in ordinary cases, Kocher's subcostal in acute cases, and the paramedian when the diagnosis is in doubt and the lower abdomen may be the seat of the trouble.—A. R. S.] After a complete diagnosis has been made, the appendix is removed. [Opinions differ here.—A. R. S.] "It is never necessary to open the common duct to see whether it contains a stone: careful palpation and familiarity with the region are all that is necessary, and even the smallest of stones can thus be detected." If a stone is found, it is dealt with first. The rest of the abdomen is packed off with rubber-faced swabs, held back by the assistant's left hand, and the liver is rotated by drawing it down from under the ribs and pulling gently forwards. The neck of the gall-bladder is pulled up by forceps, and the common duct exposed, with a finger in the foramen of Winslow (*see below*). The stone is now cut down upon and removed, and a malleable probe passed down into the duodenum. A thick-walled tube is then left in the duct, passed upwards, and also a catheter, passed downwards into the duodenum, to provide for early feeding. [This device is not widely used.—A. R. S.] The edges of the duct are sutured, with a stitch of catgut to hold the tubes. The meeting-place of the three ducts is now exposed by incising the peritoneum over the neck of the gall-bladder, and the fat stripped down with gauze. A closed cholecystectomy forceps is passed round the cystic duct, and this is freed by opening the blades. The duct is now tied about 2 mm. from the common duct. The cystic duct is cut, the peripheral end being held up with cholecystectomy forceps. The cystic artery is now exposed and dealt with in the same way; there may be two. The gall-bladder can now be stripped from its bed from neck to fundus and removed unopened. The peritoneum flaps are sutured across the raw liver area. A drain is left in the right kidney pouch, and an omental veil drawn between the duodenum and the gall-bladder bed by sewing omentum to the edge of the falciform ligament. The drain in the renal pouch comes out after two days; the tube in the common duct is removed when its stitch works loose, perhaps after fourteen days.

[The above is a good standard operation. Personally, we modify it, *in the most difficult type of case only*, as follows: The adhesions having been stripped off from the gall-bladder, cutting exactly where they meet the gall-bladder wall to minimize hæmorrhage, the fundus is held up with toothed forceps by an assistant, and the gall-bladder opened and slit down on its free border as far as the neck. One or two arteries will spout and need forceps. It is comparatively easy now to pull the cystic duct well up, even in the worst cases. It having been ascertained that there are no stones in the three ducts, the gall-bladder is cut away from the cystic duct just at the junction and removed, the cystic duct being left behind. This procedure may not be ideal, but if one takes care to keep quite close to the gall-bladder mucosa in the cutting

PLATE XVI

VISUALIZATION OF BILE-PASSAGES

(L. GINSBURG AND E. W. BENJAMIN)

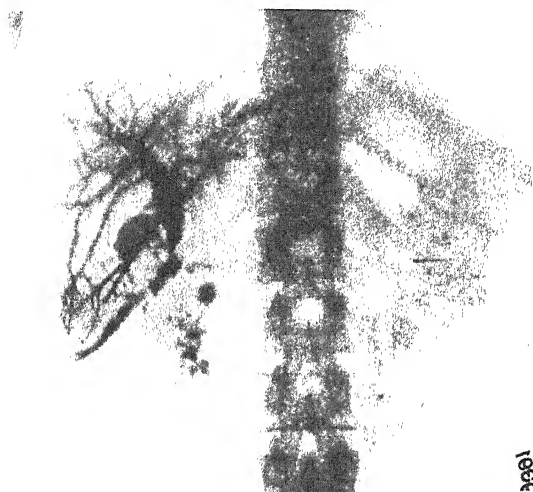


Fig. A.—Illustrating injection of lipiodol through abdominal post-operative biliary fistula of two months' duration with incomplete stricture of the common duct. 1, Tube in sinus tract; 2, Stump of gall-bladder; 3, Common duct with small quantity of lipiodol passing into duodenum. The hepatic ducts down to the very fine intrahepatic biliary radicles are outlined due to reverse flow above the stricture.



Fig. B.—Retained stone at the papilla of Vater; appearance four hours after injection of lipiodol. 1, Dilated common duct with retained lipiodol; 2, Probable site of obstruction near papilla of Vater.

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PLATE XVII

RECONSTRUCTION OF COMMON BILE-DUCT

(A. J. WALTON)

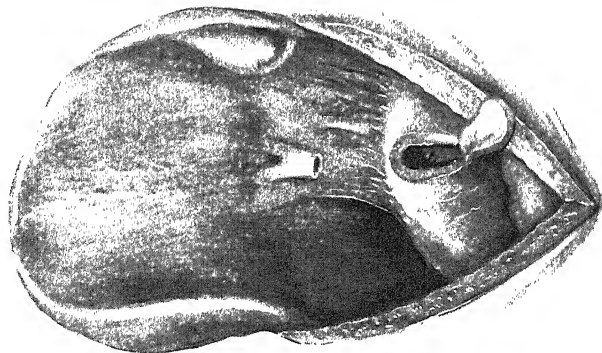


Fig. A.—A flap has been cut on the anterior surface of the duodenum.

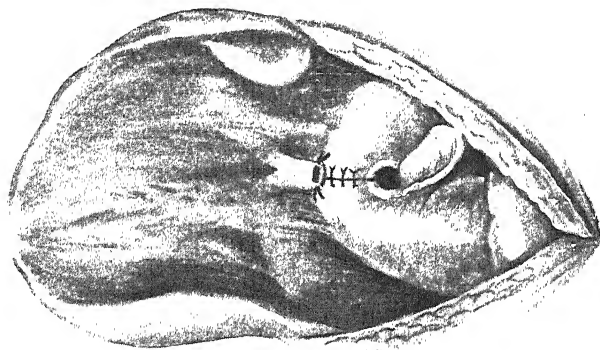


Fig. B.—The upper portion of the opening in the duodenum is sutured to leave an opening of the same calibre as the divided duct.

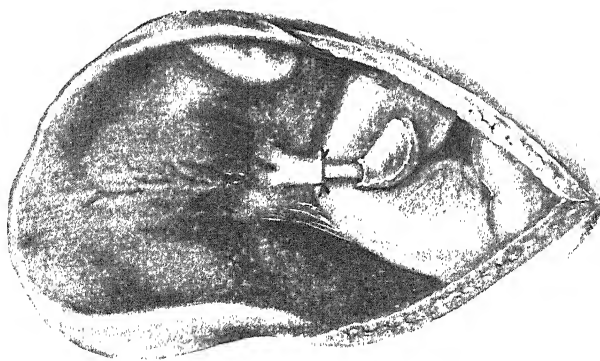


Fig. C.—A tube 1½ in. long and of the largest possible diameter is inserted into the divided duct and sutured into place with one stitch.

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away it is safe, and avoids the dangerous area. The cystic artery can usually be seen and secured just before it is cut.—A. R. S.]

R. P. Rowlands,¹² writing in the same series of articles, adds the following points in dealing with the technique of choledochotomy. The stone in the duct is to be pushed into the best place before the duct is opened. If there is any doubt which is the duct, explore with a glass syringe with a fine needle. The bile may be green or white. Two sutures are inserted to hold the duct, then it is opened longitudinally. It often helps to rotate the common duct so as to display its posterior aspect. If the lumen is big enough, explore the common and hepatic ducts up and down with the *finger*; a wad of gauze will clear the passages of débris. If the stone lies too far down to be reached above the duodenum, it may be got out by the retroduodenal or transduodenal method.

The third article in the series, by A. J. Walton,¹³ deals with reconstruction of the bile-ducts (*Plate XVII*), usually for operative injury to the common duct. The surgeon's landmarks, if the gall-bladder has been removed, are the upper border of the duodenum and the foramen of Winslow. The dilated duct having been identified—no mean task—the duodenum is mobilized and pulled up towards the liver, and the end or side of the common or hepatic duct sewn to an opening in the duodenum. Often they will not meet. In that case a flap of duodenum is cut (*Plate XVII, A*), and united to the end of the duct, folded in tubular fashion over a rubber tube, which is fixed by a catgut stitch, and left to come away through the intestines when the catgut dissolves.

S. H. Mentzer and J. H. Woolsey¹⁴ mention that the separation of the gall-bladder from the liver bed can be facilitated by injecting **Saline** between them. They very rightly advise a stab-drain in preference to one coming out through the wound. J. B. Deaver¹⁵ highly praises **Diathermy** as a means of keeping up the temperature of the liver during gall-bladder operations. F. Kaspar¹⁶ and H. Finsterer,¹⁷ both of Vienna, contribute papers on an operation they call *external choledcho-duodenostomy*—that is to say, an anastomosis between the common duct and the duodenum—for cancer of the ampulla of Vater or pancreas, stricture of the duct low down, and similar obstructive conditions. Kaspar relates 38 such operations, with only one death. Finsterer has had 41 cases, 2 ending fatally. Occasionally an *internal choledcho-duodenostomy* is possible, the duct being reached by a transduodenal route. Finsterer objects to the practice advocated by some Central European surgeons of dilating the ampulla of Vater, or leaving the tube in it, as it may lead to pancreatitis or stenosis of the ducts. Instead, he makes a new opening between the dilated common bile-duct and duodenum. The indications are when there are numerous stones in the ducts, cholangitis, or pancreatitis. He has performed this operation forty-five times with a mortality of 4.5 per cent. The abdomen should be drained. All the patients who recovered were relieved of their symptoms.

Waltman Walters¹⁸ recommends that the operation of *cholecystenterostomy* for *chronic jaundice* should be done in two stages, to minimize risks. The first stage consists in inserting a tube into the gall-bladder, to relieve the jaundice and back-pressure; a fortnight later the anastomosis is made between the gall-bladder and duodenum.

Treatment of Cholecystitis.—R. H. O. B. Robinson¹⁹ discusses the advantages of a cholecystgastrostomy for this condition. Drainage externally is only temporary in the relief it gives. Removal of the gall-bladder is like shutting the stable door after the horse is stolen; the ducts and pancreas are already infected, and the symptoms continue. Diverting the bile into

the stomach, provided of course that the cystic and hepatic ducts are patent, does at least give permanent drainage. He relates 18 cases so treated; 16 were cured and 2 relieved. In some of these the anastomosis was into the duodenum, but mostly into the stomach.

Statistics.—R. P. Rowlands,²⁰ putting together all kinds of operations for all conditions of the gall-bladder, has had a mortality of 6.3 per cent in 175 private cases during ten years. In his wards at Guy's Hospital during fourteen years there were 251 operations with 7 deaths (2.8 per cent).

A. Rendle Short²¹ reports 140 cases operated on for all sorts of gall-bladder conditions (including septic cases and stones in the ducts) during ten years, with a mortality of 4.3 per cent. One death was from apoplexy; two were due to doing too much to patients who were heavily infected.

A. Bonadies,²² of Rome, gives details of 123 cases operated on for gall-stones or cholecystitis, with 9 deaths (7.3 per cent). No case died which at the time of operation was without jaundice and without fever. In 4 cases there was a recurrence of stone.

J. McKenty,²³ of Winnipeg, presents a study of 381 operated cases, with a general mortality of 4.9 per cent. The details are as follows:—

| CONDITION AND OPERATION | CASES | DEATHS | PER CENT |
|---|-------|--------|----------|
| In 58 cases of acute cholecystitis with stones:— | | | |
| Cholecystectomy was done in | 23 | 5 | 21.7 |
| Partial cholecystectomy in | 15 | 1 | 6.6 |
| Cholecystostomy in | 20 | 2 | 10.0 |
| | 58 | 8 | 13.7 |
| In 143 cases of chronic cholecystitis with stones:— | | | |
| Cholecystostomy in | 40 | 0 | 3.5 |
| Cholecystectomy in | 103 | 5 | |
| In 148 cases of chronic cholecystitis without stones:— | | | |
| Cholecystectomy in all | 148 | 2 | 1.3 |
| In 24 cases of stones in the common duct:— | | | |
| Cholecystectomy with drainage of common duct | 15 | 4 | 16.6 |
| Cholecystectomy with transduodenal choledochotomy | 4 | | |
| Cholecystostomy with drainage of common duct | 5 | | |
| In 8 cases of stricture and section of duct:— | | | |
| Repair over Sullivan tube in | 4 | 0 | — |
| Repair by suture only | 2 | | |
| Exploration, l; repair by T-tube, l | 2 | | |
| Total number of cases | 381 | 19 | 4.9 |

Associated operations were: appendectomy in 172, gastric 11, pelvic 9, intestinal 9, and miscellaneous 7.

A follow-up showed that amongst the cases of gall-stones, of 172 traced there were 48 cholecystostomies, with 50 per cent good results, 16.6 improved, and 33.3 recurrence of symptoms. Of 95 cholecystectomies, 95 per cent were a success. Of 16 cases of stones in the common or hepatic duct, 81 per cent did well and 2 recurred. The results of operation for cholecystitis, as others have found, were less satisfactory. Of 87 cases giving a typical history, 75 per cent were cured, 19 per cent better, and 8 per cent no better. Amongst 32 with atypical history, 13 per cent were cured, 42 per cent improved, and 47 per cent no better.

R. D. McClure,²⁴ of Detroit, reports 31 deaths in 700 operations (4.4 per cent). Heart failure accounted for 9, bronchopneumonia for 7, and pulmonary embolism for 5.

Post-operative Troubles.—R. B. Cattell and E. D. Kiefer²⁵ have made a study of unsatisfactory results after removal of the gall-bladder, 55 cases being passed in review. Post-operative hernia occurred in 6 per cent of the operated cases. Some of the patients had colon troubles. The greatest group of poor results was after the gall-bladder had been removed for non-calculous cholecystitis. No doubt in many of these the diagnosis was wrong.

W. Walters and J. M. Marshall,²⁶ of Rochester, Minnesota, refer to four cases in which there was a reflux of pancreatic and duodenal contents through a tube left in the common duct for drainage, with self-digestion of the wound; one died. Abundant **Fluids** should be given by mouth and subcutaneously, and the tube clamped. If it does not stop, **Jejunostomy** may be done and the fluids re-injected.

B. O. Pribram²⁷ considers that continuing symptoms after removal of the gall-bladder are often due to hepatitis, and recommends **Diet** and **Irrigation** as a method of treatment. In addition he gives **Thyroid** preparations to detoxicate the liver, and claims frequent improvement in the fat-tolerance and other symptoms.

Cancer of the Gall-bladder.—At the Mayo Clinic, according to E. S. Judd,²⁸ the incidence of cancer amongst their gall-bladder patients has fallen from 5 to 0.5 per cent, probably on account of the numerous early operations for gall-stones. It usually affects women, and is rare before 50. The condition may be latent, but in most cases the history is suggestive. After a long course of attacks of gall-stone colic, the patient loses weight and has progressive weakness, anorexia, vomiting, and constant pain. Nearly all the cases also have gall-stones. Of 56 patients operated on, 7 survived a three-year period.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 37; ²*Brit. Jour. Surg.* 1930, April, 578; ³*Presse méd.* 1930, Feb., 161; ⁴*Brit. Jour. Surg.* 1929, Oct., 203; ⁵*Ann. of Surg.* 1930, May, 694; ⁶*Rev. de Chir.* 1929, No. 9, 614; ⁷*Ann. of Surg.* 1930, Feb., 233; ⁸*Presse méd.* 1929, Nov., 1437; ⁹*New Eng. Jour. Med.* 1930, Jan., 203; ¹⁰*Ibid.* 219; ¹¹*Surg. Gynecol. and Obst.* 1929, Aug., 181; ¹²*Ibid.* 186; ¹³*Ibid.* Oct., 526; ¹⁴*Ibid.* July, 76; ¹⁵*Ibid.* Sept., 308; ¹⁶*Deut. Zeits. f. Chir.* 1929, Sept., 91; ¹⁷*Ibid.* Dec., 417; ¹⁸*Surg. Gynecol. and Obst.* 1929, Sept., 376; ¹⁹*Lancet*, 1930, i, 673; ²⁰*Ibid.* 1929, ii, 1075; ²¹*Bristol Med.-Chir. Jour.* 1929, 243; ²²*Policlinico (Ses Chir.)*, 1929, July, 341; ²³*Canad. Med. Assoc. Jour.* 1930, Jan., 11; ²⁴*Ann. of Surg.* 1929, Aug., 253; ²⁵*Jour. Amer. Med. Assoc.* 1929, Oct., 1270; ²⁶*Surg. Gynecol. and Obst.* 1930, March, 627; ²⁷*Deut. med. Woch.* 1929, Oct., 1768; ²⁸*Arch. of Internal Med.* 1929, Nov., 735.

GAS GANGRENE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

E. E. Larson and D. Schuyler¹ state that "acute putrefaction of tissues *in vivo*" was, until the World War, a clinical curiosity. Radical surgery, supplemented by the use of sera, was found during the War to be the most satisfactory method of treatment. It is now recognized that anaerobic infections are quite widely distributed in civil practice. Gas-forming organisms in themselves have little power to attack tissues, but when associated with other organisms they rapidly produce the typical disease. In diagnosing the onset of gas gangrene pain will be found disproportionate to the amount of injury, and the acuteness of intellect displayed by the patient is noticeable. These symptoms are manifest within twelve hours. Smears of the secretion and cultures make the diagnosis certain. The edges of the wound are of a dirty creamy tint and the dressings are stained with a red-tinged serum. There is no pus. Later, bubbles of gas can be seen or can be milked out of the wound, and crepitation under the skin is felt. After twenty-four hours there is a dirty greenish-grey membrane over the area, the odour is characteristic, and there is usually a thin discharge. There is increased pulse-rate, high fever, and flushing of the face. These signs manifest themselves much earlier than in the case of pyogenic infections. Tenopyr is referred to by the writers

as recommending a simple procedure for the early detection of the presence of anaerobes. He places a portion of the macerated tissue into a sterile test-tube and covers it with melted agar. If anaerobes are present, gas bubbles will be seen after a few hours of incubation. The treatment consists in débridement, irrigation, and serotherapy. Amputation may be necessary. After **Débridement** and free incision the wound is left open for drainage and exposure to the air. Packing of the wound is to be avoided. The wound may be irrigated with **Hydrogen Dioxide** or by **Dakin's Technique**. **Serotherapy** is the most important factor; the serum should be given both intravenously and locally into the deep tissues about the wound. The authors' paper is summarized as follows: (1) Anaerobic bacteria are widely distributed and anaerobic wound infections occur frequently in civil practice. (2) The most important of these organisms are *B. perfringens*, *Vibrio septique*, and *B. oedematiens*. (3) Suspicion of their presence in all contaminated wounds should be entertained. (4) Early diagnosis is imperative to prevent destruction of extremities or even life itself. (5) The cardinal points in the treatment are: (a) early débridement, with care to remove all foreign bodies; (b) irrigations and immersion of wounds with antiseptics; and (c) anaerobic serum (trivalent) locally and intravenously. (6) In seven cases the anaerobes were controlled in every instance. Only one amputation was done. This patient died of hæmolytic streptococcal septicæmia.

D. H. Kling² recommends treating gas gangrene with normal **Horse Serum**.

Many cases of latent gas gangrene infection arising amongst men several years after wounds received in the War are referred to by A. M. Hendry.³

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, March 1, 612; ²*Ann. of Surg.* 1930, Feb., 261; ³*Brit. Jour. Surg.* 1930, Jan., 467.

GASTRIC ANALYSIS. (See also LIVER, DISEASES OF.)

Robert Hutchison, M.D., F.R.C.P.

At a discussion at the Medical Society of London¹ general disappointment was expressed with the help given by the test-meal in diagnosis. Dr. Copeman said that it had been given up in France and largely also in Germany. Dr. Ryle said that he found the test-meal of no value in the investigation of dyspepsias other than those in which there was gross organic disease of the stomach. In functional disorders, whether primary or reflex, the results were so varied that he believed the method to be really not worth trying. These pessimistic conclusions are confirmed by an investigation of 100 cases of gastric disease by Dr. Muriel Henderson.² "As absolute evidence," she says, "the findings of gastric analysis in different stomach conditions are too variable to be pathognomonic in their value." The one exception is carcinoma. Here the combination of findings is sufficiently definite to remove doubt, and in distinguishing carcinoma from pernicious anæmia they are of great value.

J. F. Venables³ states that the incidence of hyperchlorhydria in ulcer cases is apt to be understated. In a series of cases examined at New Lodge Clinic the acidity was above the normal in 58.4 per cent of cases of gastric ulcer and in 90 per cent of duodenal ulcer cases. (See also GASTRIC AND DUODENAL ULCER.) After treatment of the ulcer (by medical means) the acidity was found, in a large majority of cases, to have risen. This may be attributed to the disappearance of a co-existing gastritis.

E. C. Dodds and J. D. Robertson,⁴ using a special modification of the test for lactic acid, find that the presence of this acid cannot be regarded as diagnostic for carcinoma. It was found to be present in just under half of the non-malignant cases, and in small quantities in several malignant ones.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 901; ²*Practitioner*, 1929, Nov. 29, 348; ³*Proc. Roy. Soc. Med.* 1929, June, 1043; ⁴*Quart. Jour. Med.* 1930, Jan., 175.

GASTRIC AND DUODENAL ULCER. (*See also GASTRIC ANALYSIS; X-RAY DIAGNOSIS.*)

Robert Hutchison, M.D., F.R.C.P.

E. S. Emery and R. T. Monroe¹ have made an analysis of 556 cases of gastric and duodenal ulcer admitted to the Peter Bent Brigham Hospital, Boston, between 1913 and 1926. Hyperacidity occurred in 50 per cent of the cases. The X rays failed to show evidence of an ulcer in 7 per cent. Gross hæmorrhage occurred in 34.8 per cent, and was the cause of death in 8. Acute perforation took place in 38 patients, 11 of whom died. Cancer was found in 4.4 per cent of the gastric ulcer cases. *No greater incidence of foci of infection was found in the ulcer cases than in the general hospital population.* The results of all forms of treatment showed that about 60 per cent of the patients were relieved after an average observation period of four years. Surgical treatment was somewhat more effective than medical. The authors admit that this result is not very satisfactory, but express the opinion that the benefits of treatment in ulcer cases are apt to be overstated. All evidence points to ulcer being a chronic disease, and present methods of treatment merely palliative. Cure probably is rare. Each method of treatment has advantages and disadvantages which must be weighed in the individual case.

Franklin W. White² finds that there is good evidence that a gastric ulcer actually heals in the period of intermission of symptoms, and that this may take place within a month or six weeks even in the case of a large ulcer. The age of the patient, the size of the ulcer, and the duration of the symptoms have little influence on the rate of healing. In 50 private cases of gastric ulcer followed for three years or more, 76 per cent reported themselves as either well or better; and of 200 cases of duodenal ulcer, 80 per cent. His experience is that medical treatment is safe and reasonable if the cases are very carefully chosen and followed.

As regards the much-disputed question of the relation of ulcer to cancer, A. F. Hurst³ quotes Stewart as finding 15.7 per cent of cases of cancer arising in ulcer, and 6.1 per cent of ulcers undergoing malignant change. Cancer is much more apt to develop in a prepyloric ulcer than in a lesser-curve one. In a series of 100 cases of cancer investigated by Hurst 20 per cent were secondary to chronic ulcer.

Walter C. Alvarez⁴ discusses the risk of insuring ulcer patients in the light of the experience of the Mayo Clinic. His opinion is that peptic ulcer is a serious disease based on some predisposition which in many persons causes the lesions to reappear again and again even after excision of part of the stomach. In the early stages it is usually easy to relieve symptoms, but in more than half the cases they tend to recur. The danger of death from bleeding or perforation is small, but many patients must ultimately be operated upon, and that carries a risk. Gastric ulcer is more dangerous than duodenal because of the risk of the ulcer's being or becoming cancerous. On the whole, ulcer patients are not suitable for insurance, but duodenal cases might be accepted as substandard risks if, after either medical or surgical treatment, symptoms have been absent for six years.

REFERENCES.—¹*Arch. of Internal Med.* 1929, June, 846; ²*New Eng. Jour. Med.* 1929, Nov. 28, 1075; ³*Lancet*, 1929, ii, 1023; ⁴*Amer. Jour. Med. Sci.* 1929, Dec., 777.

GASTRIC AND DUODENAL ULCER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Duodenitis.—W. L. A. Wellbrock¹ gives histological pictures of this condition, which may mimic duodenal ulcer, and appears to be a pre-ulcerous lesion.

Duodenal Ulcer Following a Burn.—Although described by Curling long ago in 1842, this variety of duodenal ulcer is so seldom seen that one is tempted

to wonder if it really occurs. U. Maes² reports a case in a boy of 11, which ended fatally about a week subsequently.

Gastroscopy and Gastrophotography.—K. Gutzeit³ is an enthusiast for gastroscopy for the recognition of gastric lesions. In 500 examinations he has had no accidents. Only in two-thirds of the cases can a proper view be obtained. He uses the Schindler and Korbseh instruments. An anæsthetic is used. The chief purpose is to recognize gastritis; he does not undertake to see an ulcer whenever it is present, or to distinguish between ulcer and cancer. He says that in cases of failed operation for ulcer there is always a pronounced gastritis.

P. W. Aschner and M. M. Berek⁴ praise gastrophotography. They locate a gastric lesion by means of skiagraphy, and then make the patient swallow a camera with a light, and take direct photos of the ulcer, if any. Specimen pictures are given, but they are not very convincing of the utility of the method. Because you *can* do something spectacular, it by no means follows that you *ought*.

Methods of Surgical Treatment.—For a discussion of the best established and usual methods of operating, recent numbers of the MEDICAL ANNUAL may be consulted (1927, p. 192).

E. Klein,⁵ of New York, has combined partial resection of the stomach with division of the left vagus nerve at the cardia, and finds that in eight cases the gastric juice became free from acid, whereas after resection without vagotomy in 25 per cent some acid remained. F. G. Connell⁶ seeks to obtain the same result, anacidity, by resecting a large wedge from the greater curvature near the fundus, to remove the acid-bearing area. Details of cases are not given.

E. Gioja⁷ advocates Tansini's method of performing a gastro-enterostomy. No clamps are used, each vessel is ligatured as it is seen, avoiding inclusion of the serosa. Only one suture-line is used; the mucosa heals perfectly without being sutured, and leakage will never occur. The mortality of gastro-jejunosomy was by this means, and others, reduced from 22·8 per cent [a preposterously high figure—A. R. S.] to 5·3 per cent, and in 145 cases there were no recurrent ulcers.

M. Kirschner,⁸ believing that the mortality after stomach resections is largely due to lack of food and water, makes a **Jejunostomy** at the same time to allow of early feeding.

A. Charrier and J. Villar,⁹ of Bordeaux, speak unfavourably of the Balfour operation, in which the ulcer is destroyed by cautery. They maintain that the destruction is apt to be imperfect, the callous edges and surrounding adhesions remain, and an inflammatory reaction may be set up in the neighbourhood. They prefer excision with the knife.

J. E. Briggs and L. R. Whitaker¹⁰ use an electro-surgical method for performing gastro-enterostomy, which avoids opening either the stomach or the jejunum at operation. A posterior suture having been inserted through the serous coats, and the serous and muscular coats incised, an area of mucosa, unopened, is devitalized by the electric spray from a needle electrode. A couple of stitches are put in to approximate the charred surfaces, and an anterior suture-line is inserted through the serous and muscular coats. The method saves time, needs less pulling on the stomach, and is safe against leakage.

T. S. Moise¹¹ believes that a transverse incision of the jejunum is better than the usual longitudinal opening, both for ordinary gastrojejunosomy and in uniting the stomach to the jejunum after a gastrectomy. It does not abolish peristalsis by cutting the circular muscle, and the 'hang' of the intestine makes it less likely to kink at the anastomosis.

J. B. Deaver and V. G. Burden¹² advise resection of the anterior portion of the pyloric muscular ring, to abolish pylorospasm, the mucosa being unopened. It may or may not be combined with gastro-enterostomy, or excision of a duodenal ulcer. Of 18 cases followed up, 15 did well, and only one was unrelieved. The method has at least the merit of simplicity.

Results of Surgical Treatment.—The most important publication of the year—in fact, of many years—on this subject is the collective investigation initiated by the British Medical Association into the end-results of gastro-jejunosotomy.¹³ Reports of 2609 operations, by eighty-six surgeons, the after-results being for the most part reported by the family doctor, were sent in, and these have been analysed and prepared for publication by a physician, Dr. Luff. The report should at least be fair, and represents the work, not of a few picked surgeons, but of the rank and file—as seen not by themselves, but by others. Also, it is not vitiated by too early reporting; the operations were performed between the years 1920 and 1924, and the figures were collected in 1928. The general results may be gathered from the appended table :—

Table I.—B.M.A. COLLECTIVE INVESTIGATION: AFTER-HISTORY RESULTS OF GASTRO-ENTEROSTOMY.

| | DUODENAL | PYLORIC | GASTRIC ULCER | HOUR-GLASS STOMACH |
|------------------------------------|----------|---------|--------------------|-----------------------|
| Cases— | 995 | 454 | 538 | 65 |
| Males | 83.6% | 72.4% | 66.2% | 15.4% |
| Females | 16.4% | 27.6% | 33.8% | 84.6% |
| Operative mortality .. | 5.0% | 2.6% | 8.9% | 12.3% |
| Good recovery .. | 91.5% | 95.4% | 90.5% | 84.6% |
| Delayed recovery .. | 3.5% | 2.0% | 0.6% | 3.1% |
| Result { Very good .. | 67.2% | 76.3% | 74.3% | 83.7% |
| Good .. | 22.3% | 16.2% | 16.1% | 7.0% |
| Fair .. | 5.1% | 4.1% | 5.4% | 7.0% |
| Poor .. | 5.4% | 3.4% | 4.2% | 2.3% |
| Secondary gastro-jejunal ulcers .. | 2.8% | 0.9% | 0.8% | — |
| Secondary hæmorrhage | 2.4% | 1.2% | 1.0% | — |
| Fatal | 0 | 0 | 0 | — |
| Post-operative cancer | 0 | 0 | (2 doubtful cases) | 0 |

As Lord Moynihan pointed out, the term 'pyloric ulcer' is not a very satisfactory one; probably they are nearly all of duodenal origin. It will be observed that both for gastric and duodenal ulcer the good results are about nine out of ten, and the failures 5 per cent. The alarmist statements of certain Americans as to the frequency of gastrojejunal ulcer are discounted; it was only recognized in 3 per cent of the duodenal patients, and 1 per cent of the gastric cases. There was no known case of secondary cancer amongst the hour-glass, duodenal, and pyloric cases, but two, both open to doubt, after gastric ulcer. Slight diarrhœa was reported in about 5 per cent, and severe only in 0.5; constipation was commoner. Return to work was within three months in 73 per cent of the duodenal cases and 75 per cent of the gastric; more than 90 per cent were able to return to full work.

Lord Moynihan¹⁴ has analysed the figures to determine the difference between a mere gastro-enterostomy, and the same combined with removal or infolding of the ulcer (*Tables II, III*).

Table II.—PERCENTAGE MORTALITY ACCORDING TO TREATMENT.

| OPERATION | DUODENAL ULCER | PYLORIC ULCER | GASTRIC ULCER |
|---|-------------------|------------------|------------------|
| Gastrojejunostomy with removal or in- folding of ulcer | 1.8 | 1.3 | 4.6 |
| Gastrojejunostomy only | 5.7 | 2.5 | 11.4 |

Table III.—PERCENTAGE OF 'VERY GOOD' RESULTS ACCORDING TO TREATMENT.

| OPERATION | DUODENAL ULCER | PYLORIC ULCER | GASTRIC ULCER |
|---|-------------------|------------------|------------------|
| Gastrojejunostomy with removal or in- folding of ulcer | 81.2 | 72.4 | 91.7 |
| Gastrojejunostomy only | 64.5 | 44.7 | 50.9 |

The report presents some surprises. The death-rate is too high; in the best hands it is less than half that given in the report. It was generally thought that the end-results of operation for gastric ulcer, apart from big resections, were not nearly as good as for duodenal ulcer, but these figures show little difference, except a rather higher operation mortality. The gastrectomies, 101 in number, show a death-rate of 6 per cent, and, strange to say, only 63.6 per cent of 'very good' results. This is probably misleading. Lord Moynihan remarks that he has had far more patients than 101 operated on by himself by partial gastrectomy, with excellent end-results.

The results of the inquiry have been criticized by the physicians, notably A. F. Hurst,¹⁵ on the grounds that many cases were lost sight of, and perhaps did badly, and also that four to eight years is not a long enough period to give true end-results. The first may be admitted, but the general experience is that our successes pass right away from us, and our failures hang round our necks for ever, so there is no ground for believing that the lost cases did worse than those followed up. If there is to be a controversy about end-results between the physician and the surgeon, is it not probable that extending the observation period will disconcert the former at least as much as the latter, by bringing to light some late relapses?

J. M. T. Finney and E. M. Hanrahan, jr.,¹⁶ present a statistical study of 235 cases operated on for duodenal ulcer between 1900 and 1925, as found on inquiry in 1927. The patients were operated upon in the Johns Hopkins Hospital and the Union Memorial Hospital (*Table IV*).

It will be observed that, as far as the end-results are concerned, the benefits of gastro-enterostomy and of Finney's favourite operation, pyloroplasty, are practically identical, but at his clinic there is a high post-operative mortality, mostly from obstruction, after gastrojejunostomy. This does not accord with the experience of others (witness the figures of the British Medical Association inquiry).

P. Bastianelli¹⁷ reports a mortality of 1.46 per cent in 147 cases of resection of the stomach for gastric or duodenal ulcer.

K. Neller¹⁸ finds that of 43 patients with gastric or duodenal ulcer treated by partial gastrectomy and seen two or more years afterwards, at the Alfona

Clinic, 36 (84 per cent) were free from symptoms, and 7 (16 per cent) had only moderate symptoms. The method followed was either the Billroth I or Billroth II, about half of each. There was generally a marked reduction of free HCl in the gastric juice. There were 13 deaths.

Table IV.—RESULTS FOLLOWING GASTRO-ENTEROSTOMY AND PYLOROPLASTY FOR DUODENAL ULCER.

| OPERATION | NO. OF CASES | DIED WITHIN SIX MONTHS OF OPERATION | NOT TRACED | NEW TOTAL | LIVING | | DIED | | IMPROVED BY OPERATION | NOT IMPROVED BY OPERATION |
|--------------------|--------------|-------------------------------------|------------|-----------|----------|------------|--------------------------------------|--|-----------------------|---------------------------|
| | | | | | Improved | Unimproved | Causes related to original condition | Causes not related to original condition | | |
| Gastro-enterostomy | 96 | 16 (16·6 %) | 15 | 65 | 54 | 4 | 2 | 5 | 59 (90·8 %) | 6 (9·2 %) |
| Pyloroplasty | 139 | 8 (5·8 %) | 25 | 106 | 91 | 11 | 0 | 4 | 95 (89·6 %) | 11 (10·4 %) |

R. Lewisohn¹⁹ believes that the best operation for chronic gastroduodenal ulcer is partial gastrectomy by the retrocolic Billroth II method. In 44 cases he had only one death. He advises early operation without wasting much time over medical treatment, in order to prevent grave complications such as perforation and hæmorrhage. A gastrectomy is preferable because it is less likely to be followed by need for a secondary operation, and secondary operations carry a high mortality. In poor risks a blood transfusion before the surgeon gets to work is very useful.

Recurrent Ulcer after Gastric Operations.—D. C. Balfour²⁰ points out that in these patients the prospect of relief by medical treatment is not so good as in primary cases, and that if it is necessary to operate again, the ulcer must be removed, more free drainage must be given, and if the original ulcer has healed without deformity it is reasonable to restore the normal anatomical relationship. He is convinced that a conservative type of operation is better than a big gastrectomy. The patient will have to avoid tobacco, and every care will need to be taken with the dietary. When an ulcer recurs after a gastrectomy, it is often best to make a temporary jejunostomy to feed the patient up until more can be safely done.

H. von Haberer,²¹ of Düsseldorf, has performed the enormous number of 2310 gastric resections, 1276 being by the Billroth I method, which he thinks the best, and he has found recurrent ulcer only in 15, or 0·6 per cent.

According to R. Wanke,²² of Kiel, the less the surgeon found at the first intervention, the more likely are poor results to follow. The two main sources of failure are recurrent ulcers and chronic gastritis. There are cases of such persistent recurrent ulcer that they are surgically incurable. Failures are more numerous after palliative operations and transverse resections than after the Billroth procedure. A secondary operation for ulcer is successful in 80 to 95 per cent of cases when a pylorus-antrum resection is done; the Billroth I method is the best. Post-operative chronic gastritis spoils a good many results; it is usually diagnosed as adhesions, neurosis, etc. These patients are surgically incurable. Cases of gastric ulcer of less than three years' standing ought not as a rule to be operated on, and cases of over twenty years' standing are likely to be complicated by gastritis, especially if the ulcer is near the fundus.

Gastrojejunocolic Fistula.—Gravinese,²³ of Monopoli (Italy), contributes a very long article on this dangerous sequela of gastro-enterostomy for ulcer, which has been discussed in previous numbers of the MEDICAL ANNUAL (see 1929, p. 199). He believes the best treatment to be a preliminary cæcostomy, followed some weeks later by a partial gastrectomy on the Polyá plan, or resection of the gastrojejunostomy and ulcer. The hole in the transverse colon is closed. The cæcostomy may close spontaneously, or may need a third intervention to finish it. Out of 9 cases treated, 5 were cured.

P. Kotzoglou,²⁴ of Berlin, presenting a study of 117 cases from the literature, including 2 of his own, shows that the natural tendency of these cases is to end fatally. The safest treatment is to separate the colon, jejunum, and stomach, and to close the orifice in each of the three.

Stenosis of the Orifice of a Gastro-enterostomy.—In France certain surgeons still employ a button instead of suture to make a gastrojejunostomy, consequently they still see cases of stenosis of the opening. B. Delore and J. de Girardier²⁵ relate sixteen in which it was necessary to operate again, and either make a new opening or enlarge the original one.

Perforated Gastric Ulcer.—R. T. Vaughan and H. A. Singer²⁶ urge the value of X-raying to demonstrate the presence or absence of pneumoperitoneum in cases in which this disaster is suspected. The pictures should be taken with the patient recumbent, and also lying on the left side to allow gas to escape through the perforation. The free gas can be seen in about 85 per cent of the cases.

Singer²⁷ believes that a considerable number of patients with a small perforation recover without operation. He collected forty cases in eighteen months from one hospital in Chicago. The evidence of perforation was classified under four headings. In the first group, operation shortly after the accident showed a sealed perforation. In the second, patients with a chronic ulcer giving a history of an acute attack were later found to show adhesions around the healed perforation. In the third, the diagnosis was made by X-ray evidence of pneumoperitoneum. In the fourth group, the history was suggestive, and X rays showed a crater. He thinks probably 50 per cent of patients with a perforated ulcer would recover without operation. [We have seen a certain small number of cases that bear out Singer's contention, but do not agree that as many as 50 per cent would recover.—A. R. S.] In another paper,²⁸ he and Vaughan describe *formes frustes* of perforated ulcer, with typical symptoms, but passing off and going on to spontaneous recovery. They may show pneumoperitoneum. The happy result is due to sealing of the perforation.

An unusually large number of surgeons, from various countries, publish their results of operation for this condition, which have been combined in Table I.

If we regard Table V carefully, it will be observed, first, that it represents the practice of many countries. The death-rate varies from 13 per cent at Manchester to 33 per cent at Melbourne, when the operation usually performed is a simple suture. Probably the methods and skill of the surgeon are not a very important factor in these differences of mortality. An efficient organization to get the patient to the hospital early is much the most likely element making for success. At Manchester 75 cases—that is, nearly half the total—were operated on within six hours of perforation, and only 5.3 per cent died. Another factor is the relative number of gastric and duodenal perforations. At Manchester 133 were duodenal or pyloric and only 21 gastric; of the duodenal cases only 8 per cent died, and of the gastric 33 per cent. Enoch and Harries mention the same difference. [I drew attention to this many years ago. Naturally there is likely to be a far greater efflux of stomach

contents from a gastric perforation than from one beyond the pylorus.—A. R. S.] Bryce advises against infolding large areas of the stomach; it is better to approximate the edges and apply an omental graft if a small infolding will not effectually close the orifice. Williams uses a double drainage-tube, the inner tube passing through the pylorus into the duodenum for purposes of early introduction of fluid into the bowel, and the outer draining the stomach.

Table V.—RESULTS OF OPERATION FOR PERFORATED GASTRIC AND DUODENAL ULCER.

| SURGEON AND LOCALITY | CASES | DIED | CURED |
|---|-------|----------|----------|
| | | Per cent | Per cent |
| <i>Mostly simple suture—</i> | | | |
| Bryce, ²⁹ Manchester | 154 | 13 | 32 |
| L. Urrutia, ³⁰ Madrid | 52 | 17.6 | 63.6 |
| H. Paugger, ³¹ Munich | 85 | 19 | — |
| P. Dineen, ³² New York | 142 | 22 | 78 |
| R. H. Enoch and D. J. Harries, ³³ Cardiff .. | 109 | 24 | — |
| H. Williams and C. H. Walsh, ³⁴ Liverpool .. | 158 | 29 | 41 |
| H. Searby, ³⁵ Melbourne | 113 | 33 | 25 |
| <i>Mostly suture with gastrojejunostomy or resection—</i> | | | |
| S. Judine, ³⁶ Moscow | 199 | 24 | 52 |
| (Resection cases) | 51 | 12 | — |
| H. Dworzak, ³⁷ Mährisch-Schonberg | 84 | 36 | 34 |

Many opinions are expressed with regard to the need for an immediate gastrojejunostomy or partial gastrectomy. Judine believes that it is always needed to avoid stricturing at the site of suture. [There is no risk of stricture in only a minority of cases, mostly of perforated duodenal ulcer.—A. R. S.] It will be noticed that the Moscow statistics, and Dworzak's, show a mortality after gastro-enterostomy rather higher than the average without it. Both Urrutia and Searby find no difference, and the end-results of gastro-enterostomy for perforated ulcer in Judine's and Dworzak's series are no better than after simple suture in the English cases.

Resection seems too drastic treatment for a very sick patient. At Moscow only 12 per cent died, but surgery there is on an unusual footing. The surgeon is not in private practice, but resides at the hospital, is always on the spot both for the operation and the after-treatment, and it is maintained that the collection of patients is very efficient. Indeed, Judine's article reads almost like a Soviet tract! He has had to operate on as many as five cases in one night.

It is seldom that enough attention is given to after-care. Dineen has an exact regimen for the patient to follow when he leaves hospital, and it will be seen that a very high proportion of his cases remain well. At Liverpool many of the patients are later operated on to cure their ulcer; Williams reports 53 gastro-enterostomies, of which 51 were cured.

REFERENCES.—¹*Ann. of Surg.* 1930, April, 533; ²*Ibid.* 527; ³*Ergebn. d. inn. Med.* 1929, xxxv, 1; ⁴*Ann. of Surg.* 1930, June, 875; ⁵*Ibid.* 1929, July, 65; ⁶*Surg. Gynecol. and Obst.* 1929, Nov., 696; ⁷*Ann. ital. di Chir.* 1930, Jan., 1; ⁸*Arch. f. klin. Chir.* 1929, Nov., 561; ⁹*Rev. de Chir.* 1929, No. 5, 333; ¹⁰*New Eng. Jour. Med.* 1929, July, 6; ¹¹*Surg. Gynecol. and Obst.* 1929, Oct., 532; ¹²*Ann. of Surg.* 1929, Oct., 530; ¹³*Brit. Med. Jour.* 1929, ii, 1074, 1125; 1930, i, 348; ¹⁴*Ibid.* 1930, i, 468; ¹⁵*Ibid.* 1929, ii, 1177; ¹⁶*Ann. of Surg.* 1929, Nov., 904; ¹⁷*Arch. ital. di Chir.* 1928, No. 1, 22; ¹⁸*Deut. Zeits. f. Chir.* 1930, Feb., 165; ¹⁹*Ann. of Surg.* 1930, April, 520; ²⁰*Jour. Amer. Med. Assoc.* 1929, Oct., 1037; ²¹*Zentralb. f. Chir.* 1930, Jan., 66; ²²*Deut. Zeits. f. Chir.* 1929, Nov., 263; ²³*Policlinico*, 1930, Feb., 66; April, 156; June, 226; ²⁴*Deut. Zeits. f. Chir.* 1929, Nov., 223; ²⁵*Presse*

méd. 1930, March, 299; ²⁶*Surg. Gynecol. and Obst.* 1929, Nov., 593; ²⁷*Arch. of Internal Med.* 1930, June, 926; ²⁸*Surg. Gynecol. and Obst.* 1930, Jan., 10; ²⁹*Brit. Med. Jour.* 1930, i, 774; ³⁰*Ann. of Surg.* 1929, July, 73; ³¹*Münch. med. Woch.* 1929, Sept., 1508; ³²*Ann. of Surg.* 1929, Dec., 1027; ³³*Practitioner*, 1930, April, 451; ³⁴*Lancet*, 1930, i, 9; ³⁵*Med. Jour. of Australia*, 1930, Feb., 202; ³⁶*Bull. et Mém. Soc. nat. de Chir.* 1929, Nov., 1233; ³⁷*Deut. Zeits. f. Chir.* 1929, Nov., 252.

GASTROMEALY IN CHILDREN. (See ANOREXIA, CONGENITAL.)

GASTROPTOSIS. (See STOMACH, SURGICAL DISEASES OF.)

GAUCHER'S SPLENOMEGALY IN INFANCY.

Reginald Miller, M.D., F.R.C.P.

Gaucher's disease has become a well-recognized condition since its description in 1882, but most of the recorded instances have been in adults. As the disorder is now thought to be due to an inborn error of tissue metabolism, it might be expected that infantile examples should be encountered. Particular interest therefore attaches to such a case described by A. Moncrieff¹ in an infant who died of the complaint at the age of 4 months. Perhaps the most peculiar point about the case was the occurrence of certain nervous symptoms, and as these have been noted in other infantile examples of Gaucher's disease they must be regarded as part of its symptomatology at this age. The diagnostic features are: (1) Wasting without obvious cause; (2) Head retraction, opisthotonos, and muscular rigidity; and (3) Enlargement of the spleen. Readers may be referred to Moncrieff's paper on this rare condition for details in the diagnosis, and the discussion of its relationship to the so-called Niemann-Pick disease.

REFERENCE.—¹*Arch. of Dis. Child.* 1930, v, 265.

GENERAL PARALYSIS. (See DEMENTIA PARALYTICA.)

GERMAN MEASLES. (See RUBELLA.)

GINGIVITIS, HYPERTROPHIC.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

This condition is referred to in text-books under two distinct forms—namely, 'true', and 'false' or 'pathological'. Every practitioner is conversant with the chronic general hypertrophy of the gums associated with a long-standing pyorrhœa alveolaris and chronic infection. Many of these cases have their local origin in a severe attack of Vincent's angina, which leaves the gums in a damaged condition, from which they never completely recover. The so-called true hypertrophy of gum is fortunately rare in Western civilizations. It has a more profound and less understood origin. A number of cases have been reported and commented upon from time to time. The current views may be summarized as follows:—

1. Grieg finds it has never been known to occur at birth, and only gives rise to discomfort with, or after, the eruption of the temporary or permanent dentition.

2. Hutchinson quotes a case where the hypertrophy preceded the appearance of teeth. He compares it with macroglossia.

3. Sleep does not consider the lesions to be contingent on any exciting cause. He says, "Constitutional perversion is a developing force that precedes and accompanies the advent of the teeth germs from their genesis to their maturity." He infers that the aberrant process underlying the disease may precede the advent of the dental organs.

4. Allbutt and Rolleston mention a generalized hypertrophy due to widespread dental sepsis with organisms and pus. At the same time they note

that there is a deep-seated general hypertrophy which is congenital and may not be noticed until the first dentition.

Regarding the associated conditions :—

Mental Deficiency.—Grieg, from twenty-five years' experience with the feeble-minded, infers that no such hypertrophic condition can be noted as peculiarly associated with mental defects.

Molluscum Fibrosum.—Murray published a series of cases, but came to the conclusion that the hypertrophied gum tissue was secondary fibromatosis.

Abnormalities of the Hair.—A few scattered cases have been reported where the hair is excessive in amount all over the body, the hair of the head being abundant and coarse, and the nasal vibrissæ very long.

B. G. Anderson reports observations on 5000 Chinese patients showing 90 per cent to be affected. This undoubtedly indicates that the disease is exceedingly common in the East. Perkoff quotes a case where X-ray examination revealed the total absence of the primary dentition and an abundance of hair. Microscopically the gum tissue resembled a diffuse fibroma. He suggests that there is a definite correlation between the hair and the teeth, and that embryologically there is evidence of the relation between the anterior lobe of the pituitary gland and the buccal cavity. It is well recognized that in these true congenital hypertrophies of gum, treatment has to be somewhat drastic. There appears to be a low type of what one might term local malignancy. The mere cutting away of the redundant gum tissue is not sufficient. I have more than once seen a fairly rapid increase in growth take place following such treatment. It appears to be necessary to scrape the underlying bone even to resecting a portion of it. In a severe case that I asked a general surgeon to assist me with, **Diathermy** was used very successfully. The patient, a child of 6, had developed a steadily progressive enlargement of the gum tissue, was quite unable to shut the lips, and on lying down immediately started choking. Investigation showed the palate to be practically filled with hypertrophied mucosa and the post-nasal space full of adenoid tissue. The diathermy left a small area of necrosis in the right lower molar region, the sequestrum being eventually thrown off.

BIBLIOGRAPHY.—*Lancet*, 1929, June; *Nat. Med. Jour. of China*, 1929, xv, 453.

GLANDERS.

J. D. Rolleston, M.D.

J. W. Roeloffs¹ illustrates the rarity of both the acute and chronic forms of the disease by the fact that the last case published in Holland was recorded in 1913 by van der Valk, who reported a case of chronic glanders. Roeloff now describes a case in a laboratory attendant, age 33, in whom the disease appeared with septicæmic symptoms after an incubation period of a few days. At the end of a fortnight the patient developed a characteristic rhinitis with a sanious discharge, typical lesions in the skin and mucous membranes, and characteristic foci in the lungs. Glanders bacilli were found in the blood, skin lesions, and throat mucus. Treatment, which consisted of intravenous injection of 5 c.c. of a 2 per cent solution of **Trypaflavine**, was of no avail, and death took place after nineteen days' illness.

REFERENCE.—¹*Nederl. Tijds. v. Geneesk.* 1929, July, 13, 3272.

GLANDULAR FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—H. L. Tidy,¹ J. D. Rolleston,² R. Hodson,³ and G. Evans and W. A. Robb⁴ draw attention to the epidemic prevalence of glandular fever throughout the country. J. D. Rolleston, who has summarized the literature on the subject in the *MEDICAL ANNUAL* since 1923, remarks that, owing to its slight but undoubted degree of contagiousness, its tendency to

appear in sporadic as well as in epidemic form, and the long period of subsequent ill health, glandular fever may be compared with epidemic diseases of the nervous system, and suggests making such cases notifiable and admitting them to isolation hospitals.

The increased prevalence in different parts of Germany of glandular fever associated with a high mononucleosis, remittent fever of three or four weeks' duration, and an invariably favourable course is notified by P. Karger,⁵ F. Meyer,⁶ E. Koenigsberger,⁷ A. Orgler,⁸ H. Mettenheim,⁹ S. Buttenwieser,¹⁰ W. Mausbacher,¹¹ and K. Ochsenius.¹²

SYMPTOMS AND COMPLICATIONS.—M. Radford and J. D. Rolleston¹³ record two cases of *glandular fever simulating typhus* for which they were sent to a fever hospital, in a girl, age 16, and her mother, age 36. The resemblances to typhus were the sudden onset, high fever, bronchitis, deafness, retention of urine in the girl, and the positive Wassermann reaction; while the points against such a diagnosis before the appearance of the glandular enlargement were the indefinite character of the eruption, the negative diazo and Weil-Felix reactions, and the absence of any known source of infection. Several writers, such as E. Glanzmann,¹⁴ H. L. Tidy,¹⁵ and Evans and Robb⁴ have recently described rashes in glandular fever resembling scarlet fever, measles, rubella, or the rose spots of enteric, but in none of their cases did the eruption resemble typhus. The positive Wassermann reaction in the absence of any other evidence of syphilis has been noted in several other cases in the present epidemic, and the same is true of the late development of the glandular enlargement. In the cases described by Radford and Rolleston the glands did not become obviously enlarged until the 25th and 19th day respectively, when examination of the blood showed the presence of lymphocytosis, and in the cases of Evans and Robb the glandular swelling was first noted on the 10th, 14th, 17th, 18th, and 19th day of disease.

W. Stepp and H. Wendt¹⁶ remark that, unlike what is found in agranulocytosis (*see* MEDICAL ANNUAL, 1930, p. 164), in which sore throat is almost invariable, in glandular fever faucial angina is only a complication. Two of their three cases showed no throat symptoms at all, and in the third the throat did not become affected until the enlargement of the lymphatic glands was fully developed.

DIAGNOSIS.—According to Evans and Robb,⁴ the chief points in which glandular fever differs from enteric, for which it may be mistaken owing to the fever and eruption, are the lack of constitutional disturbance in glandular fever (apart from the malaise of the onset and that accompanying the evening rise of temperature), the enlargement of the superficial lymph-glands, the tendency to sweats, the lymphocytosis, and the negative Widal reaction and blood culture.

REFERENCES.—¹*Brit. Med. Jour.* 1930, i, 881; ²*Ibid.* 925; ³*Ibid.* 925; ⁴*Ibid.* 1039; ⁵*Med. Welt.* 1930, 592; ⁶*Ibid.* 594; ⁷*Ibid.* 596; ⁸*Ibid.* 597; ⁹*Ibid.* 597; ¹⁰*Ibid.* 598; ¹¹*Ibid.* 599; ¹²*Ibid.* 600; ¹³*Lancet*, 1930, ii, 18; ¹⁴*Das lymphomaeide Drüsenfieber*, 1930, 55; ¹⁵*Lancet*, 1930, ii, 521; ¹⁶*Deut. med. Woch.* 1930, 645.

GLAUCOMA.

W. S. Duke-Elder, M.D., F.R.C.S.

Little that is fundamental has emerged during the past year on the subject of glaucoma, but two matters are probably deserving of attention. The first of these concerns the diagnosis of the disease in its early stages, always a difficult, but nevertheless a very important, problem. In this connection the light sense is of importance, for the faculty of appreciation of the light minimum is found in pre-glaucomatous states to be seriously impaired; the threshold is gradually elevated and develops slowly, and in many cases never reaches the normal. A considerable amount of work has been done on the

scientific aspect of this matter; but G. S. Derby, P. A. Chandler, and M. E. O'Brien have lately elaborated a method which is capable of clinical application. From their experience of a large series of cases they have concluded that the test is of great value, and is frequently found to be the earliest sign of incipient glaucoma.

The second point of interest is the treatment of glaucoma by compounds of **Adrenalin** and **Histamine** (the so-called 'Glaucosans') which have been introduced by C. Hamburger. A study of the literature leaves no doubt that the claims made by this author are exaggerated; the following conclusions were arrived at by the reviewer after a considerably extensive experience of their use. So far as can be seen, neither of the two drugs has any prolonged effect in lowering the intra-ocular tension; their action would seem to be temporary and adjuvant to other methods of treatment, postponing perhaps, but not without any special reason replacing, operation. The action of the drugs is neither uniform nor dramatic. In chronic primary glaucoma lævo-glaucosan cannot be depended upon to lower the tension; it does so in some cases, but completely fails in others. It appears, however, that in conjunction with **Eserine** a good effect can be produced in some cases wherein eserine alone has remained ineffective. The dilatation of the pupil caused by lævo-glaucosan may be valuable from a diagnostic point of view, since the dilatation is not accompanied by raised tension. In secondary glaucoma lævo-glaucosan will succeed in rupturing synechiæ which resist the action of other mydriatics. In cases of iritis with raised tension it may be effective as a preliminary measure when hesitation is felt in giving atropine at once, or where atropine has failed to relieve the condition. Amino-glaucosan is an extremely potent miotic. It cannot be depended upon to contract the pupil and lower the tension in every case of acute glaucoma, but it would appear on occasion to be a very useful adjunct to eserine. In cases where the pupil remains dilated and the tension raised after the administration of amino-glaucosan, this preliminary treatment has undoubtedly made eserine effective subsequently in bringing about a contraction of the pupil and a lowering of the tension. Some cases have been reported where the drug has caused a rise of tension (although the reviewer has not met with any); but in several instances, although given every legitimate opportunity, it has been without any hypotensive effect. Both drugs are accompanied by a severe reaction and pain, in some cases moderate, in others involving considerable distress. The occurrence of a hypopyon ulcer in a case without other obvious cause after the use of amino-glaucosan suggests that the severity of the reaction on the superficial parts of the eye is not without danger to the cornea, especially in cases where infection is known to be present.

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GLYCOSURIA. (See DIABETES.)

GOITRE. (See also THYROID GLAND.) *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Subtotal Thyroidectomy in Exophthalmic Goitre.—E. H. Pool¹ discusses this subject, and points out that there must be reasonable expedition, control of hæmorrhage, adequate removal of thyroid tissue, and preservation of the parathyroid glands and recurrent laryngeal nerves. Only a small portion of each lateral lobe should be left, and this must be a definite part—namely, that which is in relation to the recurrent nerves and parathyroids. The latter usually lie in or on the posterior surface of each lobe. Each lobe is freed,

This is done by dividing the isthmus and dissecting it from the trachea. The superior thyroid vessels are ligated and divided. The inferior and middle thyroid veins are ligated and cut and the outer surface of the lobe is freed. The whole lobe may then be lifted, thus demonstrating clearly the part to be left. The resection can then be carried out. One feature in the exposure requires emphasis. The sternothyroid is inserted along the oblique line of the thyroid cartilage and thus is in close relation to the upper part of the lateral thyroid lobe. The sternohyoid, having a much higher insertion, may be widely retracted, and so it is only necessary to divide the sternothyroid. No effort need be made to repair the muscle at the close of operation. The pyramidal lobe and fascia above the isthmus is first divided so as to expose the trachea. The pyramidal lobe is subsequently removed. A special curved clamp is passed down along the trachea between it and the isthmus without hæmorrhage. The isthmus is clamped on either side of this and divided. The two halves of the isthmus are then dissected from the anterior aspect of the trachea with little or no bleeding. Clamps are placed on the vessels from quarter to half an inch from the extreme posterior part of the lobe, and the gland is cut and removed anterior to them. Only three or four clamps are necessary. Complete hæmostasis is as a rule easily secured by mattress sutures passed through the tissues beneath the clamps. A drain is usually introduced laterally.

Retrosternal Goitres.—In reference to retrosternal goitres C. G. Heyd² states: After division of the superior pole the isthmus is divided in the median line, with the result that the goitre is rolled, as it were, from its bed downward and forward over the chest and so out of the superior thoracic aperture. In the other goitres we have at the beginning divided the isthmus, then ligated and divided the superior pole, and by gentle traction forward and outward have then been able to place hæmostats along the lateral surface of the thyroid lobe, thereby clamping the veins that enter and leave the thyroid. In addition, the hæmostats laterally give the operator a guide to the point where the resection will terminate, so that the posterior capsule, the blood-supply to the parathyroids, and the nerves are neither exposed, manipulated, nor disturbed. This results in the excision of a wedge of thyroid tissue on either side, leaving a thin film of thyroid tissue over the trachea. These procedures simplify the operation, permit early control of the bleeding, and ensure a much smoother operative technique.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, June, 1001; ²*Ann. of Surg.* 1930, April, 496.

GONORRHOEA.

Col. L. W. Harrison, D.S.O.

SERUM DIAGNOSIS.—T. E. Osmond and J. O. Oliver¹ have analysed the results of 5266 gonococcal complement-fixation tests and conclude that, when properly carried out, the test is a valuable aid to diagnosis in obscure cases. In 1443 non-gonococcal cases the percentage of positive reactions was only 0.6, so that the test is remarkably specific. On the other hand, in 187 complicated cases 94 per cent were positive, while in 1733 uncomplicated cases proved microscopically the percentage of positive reactions rose with the age of the disease. Thus in 701 cases of from one to ten days' duration the percentage was 12.4; in 137 of from ten to twenty-one days, 52.3; and in 895 of from twenty-one days to a year, 61.4. On the question of the value of the reaction as a test of cure the authors are not inclined to agree with those workers who believe that, after elimination of the gonococcus, the reaction quickly disappears, and cite cases in which it persisted for many months, even for a year, after all signs had disappeared. [Considering, however, the difficulty of determining the absence of gonococci, there must always be a difference of opinion

on this point. Probably a better way of arriving at a conclusion would be to collect a series showing the shortest times after apparent cure in which the reaction returned to negative.—L. W. H.] The value of the test in determining cure is in cases which, having been positive, become negative. This is strong evidence, since the previous positive indicates that the patient can react to the gonococcal stimulus. The authors did not find that a course of stock vaccine had much influence on the reaction, but an autogenous one was much more liable to affect it. [This means that a positive reaction after disappearance of signs should not lightly be attributed to the fact of the patient's having been treated with a course of injections of vaccine.—L. W. H.] The authors' review of the literature illustrates the variety of methods employed in the preparation of the antigen. This, indeed, is the key reagent, and failure of care in its preparation may explain the disappointment experienced by many workers with this test.

Gonorrhœal Proctitis.—H. H. Hayes,² reporting on 75 cases of gonorrhœa of the anus and rectum which he had seen in a period of five years, remarks that almost half of them had been encountered since 1928 (in about one and a half years), and thinks that a more careful search in the earlier years of the period would have resulted in the discovery of a much higher number. The 75 constituted 6.2 per cent of his rectal cases. Of 636 white males, 3.3 per cent had the affection; of 414 white females, 8.9 per cent; of 67 coloured males, 2.9 per cent; and of 101 coloured females, 14.9 per cent. Thus the figures demonstrate the greater tendency of females to develop gonorrhœal proctitis, as has been noted by numerous workers. Of the 75 cases, 12 had stricture of the rectum, and of the 12, 10 were coloured patients. In this connection the author comments on the predilection of coloured people (yellow, brown, or black) for scar formation in the urethra and in the rectum. Besides these 12 cases were 40 (not included in the 75) with rectal stricture and a history of pelvic trouble suggesting gonorrhœa.

For treatment he advises at first injections into the rectum of mild **Silver Protein**, introduced with a bulb syringe having a conical tip which can be pressed firmly against the anal wall. Later he advises irrigation with **Potassium Permanganate** or weak **Silver**. Should granulation tissue form, it is destroyed with strong silver nitrate. Abscesses usually form in the early stage and should be opened and well drained, the fistula being dealt with afterwards. If there are hæmorrhoids, it is better to remove them. Certain cases tend more than others to stricture formation; they have a continued discharge of pus and treatment of all kinds seems to do little good. For such cases the author usually does a **Colostomy** through which the canal is irrigated through and through. He mentions that patients are so much more comfortable with a colostomy that many would rather retain it. The author's useful review of the literature reveals the great tendency of gonorrhœal proctitis to ulceration, periproctitis, and stricture formation. He mentions Clemons's use of **Carbon-dioxide Snow** in stricture, and D. A. Smith (San Francisco), in discussing Hayes's paper, reported some excellent results from this form of treatment. Clemons believes that the snow helps to restore the elasticity of tissues. Hayes reported very encouraging results from **Diathermy**, which he had been stimulated to try by the reports of Kummer (Geneva) and of Bensaude (Paris).

Suppurative Epididymitis and Funiculitis.—L. Weitzel³ reports three cases which illustrate the fact that gonococcal epididymitis can go on to severe suppuration extending along the cord into the abdominal cavity and giving rise to severe constitutional and abdominal disturbance. Reclus, then Delbet and Chevassu,⁴ pointed out that in such cases the principal lesions are not

within the epididymis and vas, but consist of a peri-epididymal and perifunicular lymphangitis. In most cases such a lymphangitis resolves, leaving only nodes in which may be found small miliary abscesses (Carol). These nodes may be the centres of relapsing epididymitis. In the first of Weitzel's cases the patient developed an epididymitis which suppurated, and on incision discharged a considerable amount of pus containing sloughs. Later the supuration spread along the inguinal canal, requiring operative interference. In the second case the patient on first observation had a prostatic abscess, with retention of urine, and a small node on the tail of the left epididymis. The prostatic abscess was relieved by rectal incision, but a week later the left epididymis suppurated and there was also considerable swelling along the inguinal canal, requiring drainage. In the third case the symptoms began suddenly with violent pain in the right inguinal canal, vomiting, and rise of temperature, the whole picture resembling one of strangulated hernia. Incision released a considerable amount of pus and disclosed the sac of a congenital hernia which was very inflamed. Within the sac the epiploön was reddened but not strangulated or adherent to the sac. After about three weeks a sub-peritoneal abscess was evacuated by further operation. In all these cases the only micro-organism found was the gonococcus.

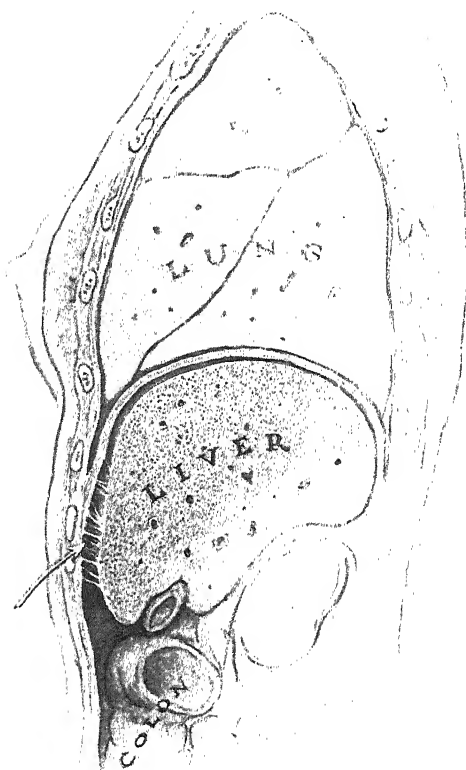
Purulent Orchitis in Gonorrhoea.—Most agree that gonorrhoeal orchitis is rare, though Ricord, Kocher, and others have held that it is not uncommon, and Fournier, as also Kocher, considered that a mild parenchymatous orchitis, even without accompanying epididymitis, could occur in gonorrhoea. In a recent article E. Langer⁵ states that in quite a large percentage of cases of gonorrhoeal epididymitis in his experience there is a serous inflammation of the tunica vaginalis and of the parenchyma of the testicle. Generally this subsides without incident, but occasionally may go on to abscess formation, of which Langer reports three cases. In the first the patient, who had suffered from gonorrhoea for a year, developed double epididymitis and right orchitis with swelling of the right cord. About three weeks after admission, when all inflammatory signs had subsided, the right testicle again swelled, and an abscess formed, the contents of which were pus and necrosed testicular substance. In the second case there was double epididymitis and the right cord was swollen. About fourteen days after subsidence of the epididymitis the right testicle became fluctuating, and puncture evacuated a considerable amount of pus and testicular substance. In the third case there was first a right epididymitis and again great swelling and tenderness of the right cord. After subsidence of the epididymitis the testicle swelled and puncture evacuated stinking pus containing *B. coli*. Thus in the two latter cases the orchitis followed the epididymitis. In all there was considerable inflammation of the cord, and the author supposes that thrombosis of the cord vessels or pressure on them by the great oedema led directly, or with the assistance of intervening bacteria, to necrosis of the testicle. Langer draws attention to the fact that in none were gonococci found, one containing *B. coli* and the other a mixture of various bacteria. Like Buschke, he does not favour the recommendation of Kuettner to excise the testicle; incision, or even only puncture, gives eventually quite a satisfactory result. Buschke also believes that gangrene of the testicle can result from gonococcal infection and blockage of the cord vessels. Winiwarter distinguishes, from cases due to interference with the vessels, others in which the gangrene is due to inflammation within the tight tunica albuginea.

Gonococcal Arthritis.—H. L. Wehrbein,⁶ reporting on 610 cases of gonococcal arthritis, divides them into four categories: (1) Arthralgia without apparent changes in the joint; (2) Cases with moderate effusion varying in

PLATE XVIII

ABDOMINAL ADHESIONS DUE TO GONOCOCCAL INFECTION

(A. H. CURTIS)



'Violin-string' or banded adhesions between the liver and the abdominal wall, frequently encountered in women with pelvic gonorrheal disease.

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'Journal of the American Medical Association'*

severity from serous to purulent, but without bony changes; (3) Osteo-arthritis, with bony changes, either atrophic or hypertrophic; (4) Rare cases in which the infection is so violent that the adjacent soft parts show great swelling with marked lymphangitis. They are particularly apt to occur in tendon-sheath affections and, if they occur in or around a major joint, ankylosis usually results. The 610 cases were classified in these types as follows: 76 in (1), 485 in (2), 44 in (3), and 5 in (4). The time elapsing between the onset of the disease and that of the complication was usually rather short, namely, 1 to 20 days in 302 cases; 20 to 60 days in 187; more than 60 days in 84; and unknown in 37. The joints affected in order of frequency were: knee 409, ankle 340, foot 118, wrist 101, hips 77, heel 63, toes 51, shoulder 49, elbow 35, fingers 34, hand 25, spine 18, mandibular, sternoclavicular, and sacro-iliac, 15 each. The author points out, however, that affections of the lower extremities, being more crippling, would be more likely to be found in hospitalized cases. An analysis of the joints affected in 73 chauffeurs amongst the 610 cases showed a high proportion in the lower limbs compared with the upper (5.6 to 1)—a fact which the author connects with the greater use by chauffeurs of their legs and feet, especially the latter.

In treatment the author is not convinced that any better results followed gonococcal vaccines than ordinary protein-shock remedies, and he is inclined to think that the improvement experienced after these was rather a matter of contrast with the wretchedness of the patient during the reaction following each injection. [Against this view is the fact that objectively there is often a very definite improvement in the joint condition after protein injections.—L. W. H.] Fairly good results followed intravenous injections of 1 per cent **Mercurochrome** (dose 3 to 5 mgrm. per kilo. body weight), but those following intravenous injections of Pregl's solution (10 to 40 c.c.) and of metaphen (10 c.c. of 1-1000 solution) were disappointing. Systematic massage of the prostate, practised in 30 cases, and injections of Pregl's solution into the seminal vesicles in 3 cases, apparently had no effect on the arthritis. On the other hand, heavy **Plaster Casts** and cross-fire **X-ray Therapy** (25 per cent of a skin erythema dose) were each successful in relieving pain, though not the duration of the disability.

A study of gonococcal arthritis of the *hip-joint* by M. Lamy,⁷ which includes 180 cases in the literature and 11 of the author's, reveals the severity of the bony changes which may result from this complication. In 6 out of the 11 cases observed by the author this led to pathological dislocation. Out of 17 cases in the series which were followed for more than two years, 1 died of septicæmia, 11 suffered from pathological dislocations, and only 3 recovered without ankylosis. The author quotes a recent paper by B. Cooperman to show that gonococcal infection of the hip-joint in infants can be very disastrous, and suggests the possibility of a gonococcal arthritis being responsible for some cases of congenital dislocation of the hip, of coxa vara, and of Legg-Calvé disease, as well as arthritis deformans and morbus coxæ senilis. In cases of gonococcal coxitis the pain is very severe, but is relieved almost magically by **Weight Extension**. This treatment is also necessary to prevent luxation.

Abdominal Adhesions due to Gonococcal Infection.—A. H. Curtis⁸ has drawn attention to the frequency of an association of 'violin-string' adhesions between the anterior surface of the liver and the abdominal wall with gonococcal salpingitis (*Plate XVIII*), and his observation appears to be supported by those of others, that patients with salpingitis frequently complain of pleuritic, atypical gall-bladder, or colitis pains in the region of the hepatic flexure. He puts on record a number of cases in which operation revealed the

association. Some of these cases are diagnosed as diaphragmatic pleurisy and others as cholecystitis.

Gonococcal Infection of the Skin.—This condition is not often reported, but routine cultures from ulcers might discover it to be less rare than is thought. V. Genner and P. Schultzer⁹ report the case of a practitioner whose hand was slightly scratched by a patient's thumb whilst retracting a gonorrhoeal prepuce. The accident was followed by severe lymphangitis of the arm and later by polyarthritis, the infection being proved bacteriologically to be gonococcal. G. M. Lawson and R. M. Smithwick¹⁰ quote two cases in the literature and report two of their own. In the first of the quoted cases an amputation wound became infected, and a chronic ulcer formed with undermined edges which was showing no tendency to heal after eight weeks. In the second a surgeon accidentally infected an abrasion on his elbow whilst operating on a patient with a vaginal discharge. An ulcer, 2.5×1 cm., with a surrounding reddened area resulted, and after this numerous bullae appeared round the ulcer, while the axillary glands became large and tender. In both cases the flora were proved incontestably to be gonococci. In the authors' cases the abdominal wounds for operation on gonococcal salpingitis became infected. The subcutaneous tissues became cedematous on the fifth and eighth days, and a large amount of sanguineous pus or serum was evacuated. In both cases gonococci were demonstrated easily, and both cleared up under **Dakin's Treatment** followed by **Argyrol**. These cases show that the skin and subcutaneous tissues are not so resistant to the gonococcus as is commonly thought.

TREATMENT.

F. R. Luke¹¹ claims invariably good results in gonorrhoeal urethritis from injection of the following lotion: Glycerin, 5 oz.; phenol sodique, 1 drachm; water to 16 oz.; this is held in for ten minutes. The injections are commenced when the acute irritation, burning, and swelling have subsided. They are supplemented by a mixture containing potassium citrate, hyoscyamus, and buchu.

D. H. Murray¹² has tested treatment of gonorrhoea by intravenous injections of **Acriflavine** (five to twenty-six of 100 mgrm. in 2 per cent solution) and has obtained no better results than from other methods. A number of his cases (11 per cent) developed jaundice, which appeared after an interval averaging 82.3 days. Most were mild, but one died of acute yellow atrophy.

H. E. Foster,¹³ in relating a case of gonococcal tonsillitis with arthritis of one wrist and signs of endocarditis, reported good results from intravenous injections of 2 per cent **Mercurochrome** at two- to three-day intervals (2, 3, 4, 5, 5, 5, and 5 c.c.).

B. Valverde and B. de Magalhaes¹⁴ report on 71 cases of gonococcal epididymitis treated with daily intravenous injections of 0.01 gm. **Mercury Cyanide** in very dilute solution in 0.9 per cent saline. They consider the remedy to be specific, and that it has great value from the social point of view since in many of the patients it prevents sterility.

Vaccine Therapy.—C. White and H. G. Winter¹⁵ report continued success with the vaccine first elaborated by Dimond (*see* MEDICAL ANNUAL, 1928, p. 193). The vaccine is made by growing the gonococcus in a special medium rich in nucleoproteins, washing off with 2 per cent saline, centrifugalizing at 9000 per minute, and taking the cream-coloured layer between the supernatant and the deposit of gonococci. This is standardized and 2 c.c. are injected intradermally in seven sites per sitting at intervals of six days. [It is interesting, and possibly explanatory of the mixed results reported by

various writers from the use of gonococcal vaccine, that the authors have found an intra-urethral injection of autolysed gonococci a strong provocative of relapse in uncured cases; further, that relapses produced in this way are very resistant to treatment. They would therefore reserve the use of this 'endotoxin' for ultimate test of cure many months after apparent healing. Possibly, too great an admixture of this 'endotoxin' in an ordinary gonococcal vaccine may make its administration actually harmful by lowering the resistance.—L. W. H.]

F. Wolff¹⁶ reports good results from the injection of the commercial vaccine known as **Gonovitan**, which is an emulsion of five strains of living organisms. It is employed particularly for chronic cases with deep-seated infections; open acute cases did not seem to be affected. The injections of the doses recommended by the makers were given at intervals of ten days, and two or three injections usually sufficed. The author has also used living vaccines made in his own laboratory, with similar results. W. Kubelstein¹⁷ reports on 49 cases of chronic gonorrhœa treated with gonovitan with the result that they were finally free from gonococci in from twenty to thirty days, having previously persisted for an average of sixty-two days. The dosage was usually 2 c.c. (occasionally 3 c.c.) every eight to ten days.

Provocative Tests of Cure in Gonorrhœa.—Perutz¹⁸ found that if a 1-400 solution of **Pilocarpine Hydrochloride** is injected into the urethra and retained for fifteen to twenty minutes, it stimulates an increased secretion by Littre's and Cowper's glands. The observation led to the idea of using it as a test of cure in gonorrhœa, and various workers have reported favourably on it. Amongst these, O. Klein¹⁹ tried it in 17 cases, and in 8 discovered gonococci in the secretions next morning. More recently A. Boss²⁰ has tried the test on 40 cases which after treatment had been negative to his routine tests (by intracutaneous injection of vaccine, injection of Lugol's solution, and resumption of alcohol). In 4 cases the pilocarpine test proved positive. Both authors therefore consider the test to be a good one. J. Schereschewsky²¹ has found the insertion of a bougie containing **Choleval** a good provocative test. The bougie is a capsule containing 1 c.c. of 2½ per cent choleval, in fact one of those supplied in the Duanti prophylactic outfit (Merk). It is ejected after half a minute, and the following morning the resulting purulent secretion is examined for gonococci. In 24 cases in which other tests had been negative the choleval proved positive 3 times.

REFERENCES.—¹*Brit. Jour. Ven. Dis.* 1929, Oct., 281; ²*Jour. Amer. Med. Assoc.* 1929, Dec. 14, 1878; ³*Presse méd.* 1929, Nov. 27, 1544; ⁴*Rev. de Chir.* 1908; ⁵*Münch. med. Woch.* 1929, Dec. 6, 2051; ⁶*Surg. Gynecol. and Obst.* 1929, July, 105; ⁷*La Corvite gonococcique*, Paris, Gauthier Villars et Cie; ⁸*Jour. Amer. Med. Assoc.* 1930, April 19, 1221; ⁹*Ann. de Dermatol. et Syph.* 1929, Aug., 856; ¹⁰*Ann. of Surg.* 1929, Aug., 243; ¹¹*Jour. Med. Assoc. S. Africa.* 1929, Dec. 14, 679; ¹²*Jour. R.A.M.C.* 1930, Jan., 19; ¹³*Jour. Amer. Med. Assoc.* 1930, March 15, 791; ¹⁴*Ibid.* March 20, 1008; ¹⁵*Jour. R.A.M.C.* 1929, liii, 250; ¹⁶*Klin. Woch.* 1929, viii, 1496; ¹⁷*Deut. med. Woch.* 1929, July 12, 1178; ¹⁸*Klin. Woch.* 1922, No. 48; ¹⁹*Dermatol. Woch.* 1929, lxxxix, 1094; ²⁰*Ibid.* 1930, July 19, 1055; ²¹*Deut. med. Woch.* 1930, lvi, 272.

GRAVES' DISEASE. (See GOITRE; THYROID GLAND.)

HÆMATOMA, SPONTANEOUS, OF THE RECTUS ABDOMINIS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

P. Malpas¹ reports two cases occurring spontaneously. The condition is probably not uncommon. Hæmatoma of the rectus may occur amongst athletes during violent effort as a result of partial or complete rupture of the muscle. In his second group hæmatomata are met with in the course of infections such as typhoid fever or influenza arising from some local lesion of the muscle.

In a third group hæmatomata are apparently spontaneous. The etiology is obscure. The clinical picture is important owing to its similarity to that of acute abdomen. The first case described by Malpas was a man of 63 in whom a provisional diagnosis of intestinal obstruction had been made. He had been reported by his relatives as being a bleeder. The extravasated blood was found at operation within the sheath of the rectus, but there was no ruptured muscle. On the fourth day after operation he vomited about two pints of dark blood, and died within an hour. In the second case an acute abdomen was again suspected. During the previous few years the patient had noticed that the slightest injury would cause a bruise, but otherwise she was healthy. The hæmorrhage into the right rectus muscle apparently followed a sharp fit of coughing. She was kept under observation for two weeks, and the swelling disappeared.

The term 'abdominal apoplexies' has been used in connection with such cases. Operative findings show that the primary lesion is a rupture neither of the muscle nor of the artery. The hæmatomata are probably related to systemic affections. Malpas quotes Grignani as believing that the immediate cause of the hæmorrhage into the rectus in these cases is probably the prolonged capillary and venous congestion produced within the muscle by a paroxysm of coughing. Palpation of the lower abdomen during such a paroxysm will demonstrate a surprisingly sustained and continuous contraction of the rectus muscle, particularly in its lower half. Unless the swelling is very large, there is little to be done at operation. The chief value of operation is the establishment of the diagnosis.

REFERENCE.—*Brit. Med. Jour.* 1930, i, 1130.

HÆMOGLOBINURIA IN NEW-BORN. (See NEW-BORN, HÆMOGLOBIN-URIA IN.)

HÆMOPHILIA.

Ivor J. Davies, M.D.

W. W. Payne and R. E. Steen¹ (London), in a study of hæmostatic therapy in hæmophilia, conclude that the bleeding time is of no value in indicating the liability to hæmorrhage in hæmophilia. No method except the injection of intravenous whole blood or plasma produced more than a transient unimportant improvement in the coagulation time. In the majority of cases a period of decreased coagulability occurred of longer duration and greater magnitude than the preceding stage (if any) of increased coagulability. The most effective agents, both for treatment and pre-operative prophylaxis, are **Citrated Whole Blood** and **Citrated Plasma**, given intravenously. Citrated human plasma, as pointed out by M. R. Feissly,² has the advantage of not requiring a preliminary blood grouping, and the use of human plasma prevents any danger of anaphylaxis. Prolonged administration of **Liver** has been advocated by J. W. Pickering³ on the theory that hepatic activity probably plays an important part in the production of those factors which are essential for blood coagulation. In Payne and Steen's hands it failed to have any material influence on the coagulation time.

REFERENCES.—¹*Irish Jour. Med. Sci.* 1929, Nov., 718; ²*Bull. Soc. méd. Hôp. de Paris*, 1924, Dec. 19, 1739; ³*Lancet*, 1929, i, 1242.

HÆMORRHOIDS.

J. P. Lockhart-Mummery, F.R.C.S.

Injection Treatment.—Victor Bellot¹ gives results of his experience with this treatment over a number of years. He finds his results very satisfactory, 90 per cent of the patients being completely relieved of symptoms within a month of commencing treatment. The fact that many patients are able to

avoid the discomforts and the necessary period of inactivity required by an operation is a great advantage. He considers this method very much superior to diathermy or any of the electrocoagulation methods. He has found it to be without danger and to give on the whole most satisfactory results in suitable cases.

REFERENCE.—¹*Presse méd.* 1929, Oct. 12.

HALLUX RIGIDUS AND VALGUS. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Hallux Rigidus.—In this condition there are all grades of limitation of movements of the big toe joint accompanied by pain. Full extension becomes impeded, and in a progressive case ends in painful fixed flexion of the metatarsophalangeal joint. Hallux rigidus is generally associated with osteo-arthritic changes in the bones forming the joint, and flat-foot is not an uncommon complication. A bar, half an inch thick, placed across the sole of the boot from just behind the head of the first metatarsal on the inner side to a point behind the head of the fifth metatarsal on the outer side may relieve the condition. In advanced cases operative treatment alone is satisfactory. The operation, as in the case of hallux valgus, consists in the free excision of the head of the metatarsal bone. The raw bony surface after removal of the head is covered with subcutaneous fascia or by the bursa, after the method of Mayo. Rubbing **Horsley's Wax** in small quantities over the divided surface of the bone also results in a satisfactory pseudarthrosis.

Hallux Valgus.—Outward displacement of the great toe may cause no inconvenience, but on the other hand may be painful and crippling. When the phalanx is pushed over to the outer side the head of the metatarsal bone becomes more and more prominent. The covering skin becomes thickened and the adventitious bursa becomes inflamed. As in the case of hallux rigidus, relief may be obtained by placing a bar across the sole of the boot. If operative treatment is required, it should be postponed until all inflammatory symptoms have subsided. The head of the bone is removed and can be covered in the manner mentioned for hallux rigidus in order that a pseudarthrosis may be formed.

In the hands of the reviewer merely removing the exostosis beneath the bursa has not been followed by success. Many surgeons excise the proximal end of the first phalanx instead of the head of the metatarsal bone, with equally good results. In hallux valgus the great toe may be displaced outwards either on top of or deep to the phalanges of the second toe. Arthritis is not nearly so common as in the case of hallux rigidus, but on the other hand arthritis of the joint or inflammation of the bursa may be the main cause of pain. When ordering boots in cases of hallux valgus or hallux rigidus, in addition to the 'football' bar already mentioned, care must be taken to have the sole straight on the inner side. In acute cases a hole over the bursa must be cut which can be filled in with a cemented leather patch, giving plenty of room. Such measures, however, are curative only in the milder cases and are not applicable to the severe types (Jones).

The operative treatment of excision of the head of the metatarsal or of the neighbouring portion of the phalanx may be modified in very active patients. In such cases it is to be remembered that the head of the bone is important for weight-bearing, and may with advantage be partially preserved. As much as possible of the under part of the head is preserved and all bony excrescences are removed with the remaining portion. Division of the long tendon is an essential part of the operation. The sesamoid bones need not be disturbed. Jones¹ emphasizes three points in the operation: (1) Preservation of part of the lower or weight-bearing portion of the head; (2) Restoration of free

dorsiflexion; (3) Correction of the valgoid deformity in cases of hallux valgus. A Jones's hallux valgus splint is applied at the end of operation. Passive and active movements should be employed during the second or third week. If adhesions form, as shown by limitation of and painful movements, they may be broken down under an anaesthetic. Three weeks after operation the patient is allowed to walk in properly made boots. The heel should be raised a little on the inner side as for flat-foot, and the leather bar already alluded to (about half an inch thick) provided. The inner border of the boot must be straight. If these precautions are not taken, relapse in some cases is to be expected.

REFERENCE.—Jones and Lovett, *Orthopaedic Surgery*, 630.

HAMMER TOE. (*See HALLUX RIGIDUS AND VALGUS.*)

HARE-LIP AND CLEFT PALATE. *John Fraser, Ch.M., F.R.C.S.Ed.*

In recent issues of the *MEDICAL ANNUAL* the subject of hare-lip, as presented in modern publications, has been fully discussed. The reader may recollect that, when an alveolar cleft complicates the hare-lip, opinion has favoured the correction of the alveolar error by wiring. The advocacy of this procedure has called forth a protest from V. P. Blair and J. B. Brown.¹ They condemn alveolar wiring for four reasons—that it produces a sinking of the upper lip,

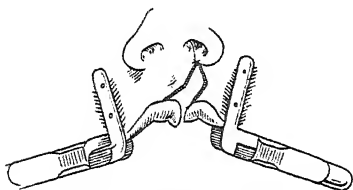


Fig. 32.—Hæmostatic clamps.

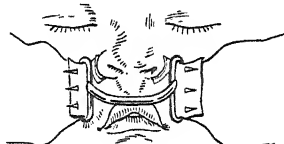


Fig. 33.—The Logan clamp in position.
Anterior view.

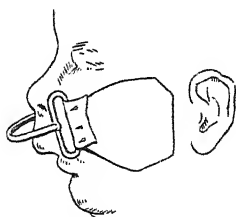


Fig. 34.—The same. Lateral view.

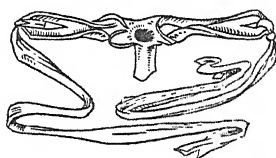


Fig. 35.—The special breathing tube.
(Figs. 32-35 re-drawn from
'Surgery, Gynecology and Obstetrics'.)

that it does not correct the displacement of the columella, that it imperils the upper incisor teeth, and that it is in fact an unnecessary procedure. They hold (and the reviewer agrees) that the uniting of the lip cleft is sufficient in the majority of cases to induce a falling-in of the alveolar projection and an approximation of the alveolar cleft. The pressure of a complete upper lip may be slight, but it is clearly an effective influence in moulding the underlying alveolus.

The operation of hare-lip repair as practised by these authors possesses certain interesting features. Calipers are used to measure accurately the incision lengths on opposing sides of the cleft, the incisions are outlined in methylene blue before the scalpel is used, special bulldog clamps control hæmorrhage from the coronary vessels, a Logan bow relieves tension on the sutured lip, and a special breathing tube prevents respiratory difficulty after

PLATE XIX

CLEFT PALATE

(C. G. BORDICK)

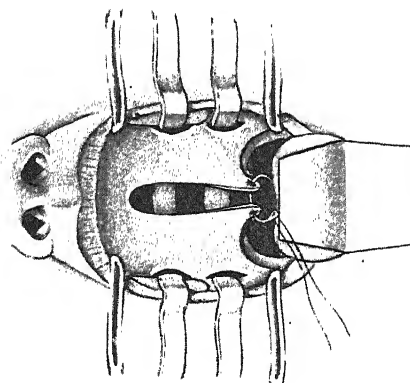


Fig. 1.—Additional relaxing incisions in the soft palate and insertion of silver bands. First suture in uvula.

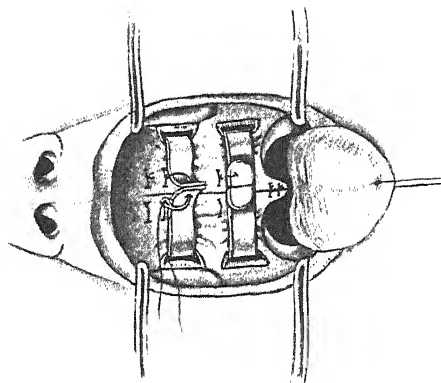


Fig. 2.—Operation completed by suturing the metal bands.

By kind permission of 'Annals of Surgery'.

operation (*Figs. 32-35*). The operation is performed within twenty-four hours of birth if the baby's condition is otherwise satisfactory; if for any reason postponement is called for, the period from the fourth to the fifteenth day is avoided because of the occurrence of birth jaundice at this time.

The after-treatment follows the usual practice except for two features—the baby is nursed on its face, and the lip wound is kept free from blood-clot by repeated sponging with equal parts of **Alcohol** and **Boric Lotion**. It is claimed that by these means scarring is reduced. The authors favour the Mirault incision.

An interesting analysis of 184 cases of hare-lip and cleft palate is given by C. G. Burdick.² It is recommended that repair of the lip and alveolus be done within ten to fourteen days of birth. Using the Vaughan-Thompson technique (*see MEDICAL ANNUAL, 1928, p. 205*), the alveolar cleft is closed by an encircling wire suture, while the lip is repaired by flaps cut somewhat on Rose's pattern, sutures threaded on small shot buttons being employed in order to lessen the degree of scarring. In cases where there is difficulty in approximating the lip edges, Burdick suggests a method practised many years ago by the late Dr. Abbé, in which a Δ -shaped flap is borrowed from the lower lip and transferred to the upper.

It is recommended that operation on the palate be delayed until after the third year, interference at an earlier date being regarded as associated with a high mortality, while no importance is attached to the claim that, in order to obtain the best results in speech, operation should be practised at an early date. The various types of cleft-palate operation are discussed, and preference is expressed for the Langenbeck-Ferguson technique. In order to relieve tension on the suture line of the palate the author encircles the flaps with narrow silver bands (*Plate XIX*).

The importance of speech education following cleft-palate operation is raised in an article by W. Kingdon Ward.³ The contribution is of great interest, but it is of such a technical character that it does not lend itself to summary, and readers are recommended to consult the original article. We are appreciating more and more the importance of speech education subsequent to cleft-palate repair. The surgeon repairs the mechanism, but the child must be taught how to use it.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, July, 81; ²*Ann. of Surg.* 1930, July, 35; ³*Practitioner*, 1929, Aug., 147.

HAY FEVER. (*See ASTHMA AND HAY FEVER.*)

HEAD INJURIES. (*See MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.*)

HEART. (*See also ANGINA PECTORIS AND CORONARY ARTERY DISEASE; ARRHYTHMIA; ENDOCARDITIS, SUBACUTE INFECTIVE; MITRAL STENOSIS; PERICARDITIS, TUBERCULOUS; PERICARDIUM, CALCIFICATION OF.*)

HEART, ACTION OF DRUGS UPON. *A. G. Gibson, M.D., F.R.C.P.*

Digitalis.—G. L. Moench¹ has seen three cases in which digitalis produced nervous symptoms. One patient, a woman of 61, who developed a moderate degree of cardiac failure, was given a bottle of the tincture, and she failed to measure out the dose to the prescribed thirty drops three times a day. When next seen she had a pulse of 60 and was excited, irritable, and restless. Forty-eight hours after stopping the drug she became perfectly normal. The second case, a female of 45, with mitral regurgitation and cardiac insufficiency, improved after being kept in bed for four weeks on the digitalis infusion;

the amount given is not stated. She was to be discharged, but became suicidal, though without symptoms of digitalis poisoning such as vomiting or excessively slow pulse. She recovered completely after a few days in a mental hospital. Another patient, a coloured man of 39 suffering from aortic stenosis and cardiac insufficiency, developed vomiting and became excited, and later maniacal, after five days' treatment by the infusion of digitalis in half-ounce doses.

James Mackenzie used to say that there was very little danger of digitalis poisoning in out-patients or private practice; patients would cease to take the drug because they became unconsciously averse to it. The last of Moench's patients is said to have stated that his medicine was 'driving him crazy'.

Strophanthin.—E. E. Cornwall² gives an account of the therapeutics of strophanthin compared with that of digitalis. Strophanthin has a direct action on the cardiac muscle which has not been found experimentally with digitalis. It does not stimulate the vagal mechanism, and appears to be used up in the body and not to be accumulated like digitalis. Both drugs, however, cause a diminished conductivity of the cardiac muscle, so that in this respect a long course of strophanthin must be given with caution. While digitalis requires a large dose to obtain the best effect, the ideal dose for strophanthin is the smallest that will be effective. The indications, therefore, for strophanthin are when myocardial weakness is suspected. The author is in the habit of using the amorphous strophanthin prepared from *Strophanthus kombé*, which is physiologically standardized.

It must be administered by the intravenous, intramuscular, hypodermic, or sublingual route. Given by the mouth a very small proportion of the dose reaches the heart muscle. For ordinary administration the sublingual route is convenient and takes the place of the ordinary mixture given by the mouth. For continuous medication $\frac{1}{1000}$ gr. may be given sublingually two or three times a day. For quicker administration the author uses the intramuscular or hypodermic routes, or, when an immediate action is desired, the intravenous. The maximum dose by this last method should be $\frac{1}{100}$ gr. and should not be repeated for at least twenty-four hours.

Purin-base Diuretics.—N. C. Gilbert and G. K. Fenn³ reinvestigated experimentally the efficiency of the purin-base diuretics on coronary flow, and they arrived at the following order of efficiency: theobromine and its salts, theophylline ethylenediamine, theophylline sodium acetate, and lastly caffeine. The value of theobromine, therefore, in conditions of angina pectoris, as originally put forward by Markiafava, is confirmed.

W. Goldring,⁴ in an investigation into the efficiency of certain diuretics in the œdema of cardiac failure, finds that digitalis is the most effective remedy in the majority of cases, but in those in whom digitalis fails to act other drugs may be of service. In 46 such patients over half were relieved by theophylline or by merbaphen, introduced in 1920 by Saxl and Heilig. The greatest effect of these secondary drugs was seen in the rheumatic group. When digitalis fails to relieve œdema, the inference is that the cardiac reserve is deficient, for even when patients subsequently reacted and were relieved of their œdema, life was prolonged beyond six months in one instance only.

REFERENCES.—¹*Med. Jour. and Record*, 1929, Oct. 2, 381; ²*Ibid.* 1930, April 2, 355; ³*Arch. of Internal Med.*, 1929, July, 118; ⁴*Ibid.* Oct., 465.

HEART DISEASE, CONGENITAL.

A. G. Gibson, M.D., F.R.C.P.

Maude E. Abbott¹ gives a workable clinical classification of congenital cardiac disease. The first and largest group is *acyanotic*—those that show no cyanosis, or cyanosis only as a transient or late phenomenon. In these cases there is

no abnormal communication between the two circulations, and the venous blood does not therefore enter the arterial stream. Such cases include coarctation of the aorta and septal defects, and also those in which blood passes from the left side to the right, i.e., an arterial-venous shunt. These patients have a relatively good expectation of life and may live to an advanced age; but the defective part is almost always the seat of strain, and there is a peculiar liability to infective endocarditis of the subacute bacterial form. The importance of recognizing this group and the liability to subsequent infection makes it necessary to exercise the same preventive care as with rheumatic cardiac disease. All foci of infection should be removed, and proper rest, freedom from undue strain, and the elimination of unnecessary risks should be provided for. This group can be identified by the pulsating murmur or thrill of unusual localization and character in the cardiovascular area in an otherwise normal person. Radiology affords another method of identification. It is noted that such patients are frequently slender in body and perhaps underdeveloped.

The *cyanotic* group is recognized by their extreme blueness, which deepens on exercise, and by the presence of atypical physical signs over the cardiac area. The differentiation of the exact lesion can seldom be determined with certainty, and only a few combinations survive into adult life, such as the tetralogy of Fallot with pulmonary stenosis, ventricular septal defect, dextra-position of the aorta, and marked hypertrophy of the right ventricle. When such cyanotic patients live beyond middle life there is usually a complete defect of the intraventricular septum with or without pulmonary stenosis.

In addition to these two groups, there is a small group that has no clinical significance and in which the abnormality produces no defect of the cardiac mechanism.

P. T. Kasakoff² gives an historical survey, reports a new case of *patent ductus arteriosus* (ductus Botalli), and discusses the question of recognition of this lesion during life. Gerhardt in 1864 recognized a bulging of the chest wall over the heart, a hypertrophy of the left ventricle, and an occasional compression of the recurrent laryngeal nerve through the distension of the duct. Polycythæmia is not a feature of the condition; pallor is much more common; clubbed fingers are rare, and, in the series of cases reported, also a prominence of the chest wall over the heart. The heart is enlarged both to the left and to the right. There is a systolic pulsation, a systolic murmur over the pulmonary arteries, and an extension into the vessels of the neck. Another sign noticed by Franck is a murmur over the back to the left of the 3rd and 4th dorsal vertebra. In the 27 cases collected the sexes were nearly even, the oldest patient was 55 years, and 15 of the cases died with cardiac complications, 9 of which were congestive cardiac failure.

REFERENCES.—¹*Lancet*, 1929, ii, 164; ²*Wien. klin. Woch.* 1929, Dec. 26, 1661.

HEART DISEASE, SYPHILITIC.

A. G. Gibson, M.D., F.R.C.P.

A somewhat rare form of syphilitic myocarditis is the subject of a paper with a case report by N. L. Chaniotis.¹ The case was that of a man of 47 who complained of periodical palpitation, dyspnoea, expectoration, and œdema of the lower limbs. There was a history of a hard chancre, but no secondary manifestations had appeared and no treatment had been given for eleven years, when there was headache and occasional interference with sight. The Wassermann reaction at that time was positive, and the patient was treated by mercury and later by '606'. One year subsequently to this the cardiac symptoms supervened. There were pulmonary râles, enlargement of the liver,

fluid in the peritoneum, and a trace of albumin in the urine. The heart was considerably enlarged, both to the right and to the left, as shown under the X rays. There was a functional mitral murmur, which quickly disappeared in hospital, as did also the œdema. Following the administration of cardiac tonics a certain amount of restoration to ordinary life occurred, with diminution in the size of the heart; but the symptoms recurred within two months, and the man ultimately succumbed suddenly during an attack of vomiting. The necropsy showed syphilitic aortitis occupying the whole extent of the aorta, but with no affection of the coronary arteries. There was a grave diffuse fibrous myocarditis of the left ventricle and some dilatation of the right.

H. Cookson² records a case of cardiac syphilis in which three aneurysms lay in the posterior wall towards the base of the left ventricle from $1\frac{1}{2}$ to $\frac{1}{2}$ in. in diameter. All the valves were normal and the coronary arteries patent except for a branch of the circumflex division of the left coronary, which was constricted as it crossed one of the aneurysmal pouches. The patient was a woman of 43 with a history of breathlessness on exertion for two years, epigastric pain on exertion for two months, and œdema of the legs for five days. The clinical diagnosis of aortic syphilis and aortic incompetence was made. The electrocardiogram showed a normal rhythm, a slight ventricular predominance, and a tendency to a negativity of the T wave in Lead I. Anti-syphilitic remedies caused an improvement and she was discharged. She was readmitted four months later with extreme congestive cardiac failure, and died in five days. Though no Wassermann reaction appears to have been done, the syphilitic origin is reasonably clear. It is also to be noted that the aortic regurgitation was probably functional from dilatation of the ring, for the valve at the post-mortem is recorded as normal.

W. Laves³ records a case of sudden death from the rupture of an aneurysm situated at the tip of the left ventricle in a child 6 months old. The mother's Wassermann reaction, taken some time previously in a neighbouring clinic, was positive. At the age of $4\frac{1}{2}$ months the child had suffered from an attack of furunculosis, and the author refers to the fact that in infants metastatic abscesses of the heart have been found in the absence of other septic features. In one of these recorded cases in a 3-year-old child there was a rupture of the heart due to staphylococcus emboli. In the present case, however, the histological appearances were due to syphilis, and there was definite interstitial myocarditis in the neighbourhood.

REFERENCES.—¹*Presse méd.* 1930, Jan. 11, 53; ²*Brit. Med. Jour.* 1929, ii, 94; ³*Wien. klin. Woch.* 1929, Nov. 14, 1469.

HEART, ESTIMATION OF EFFICIENCY OF.

A. G. Gibson, M.D., F.R.C.P.

H. A. Treadgold¹ states his opinion on some of the criteria of physical fitness in airmen. The physiological bradycardias even as low as 48 per minute are generally evidence of good cardiovascular stability. Treadgold's opinion is that such bradycardia is constitutional, and that those who have it are capable of more prolonged physical stress than the average. Those selected for officers in the R.A.F. rarely have a pulse-rate above 72. The importance of estimating the minimum blood-pressure (diastolic) is referred to and the observation made that a small pulse-pressure, so long as the systolic pressure is not too high, is evidence of cardiovascular stability. Men with low minimum pressures show a greater tendency to fainting than others. The test used to establish this tendency is rotation in a chair ten times in twenty seconds. Symptoms such as faintness and nausea accompany a fall in a person with a

low diastolic pressure, and giddiness accompanies a rise in a person with a high diastolic pressure. The importance of focal sepsis and over-indulgence in alcohol as causes of acquired high diastolic pressures should be borne in mind. A method of confirming the estimation of the diastolic pressure suggested by Captain Flack is to ask the patient as the mercury level is falling when he no longer feels the throbbing of the pulse in his arm.

REFERENCE.—*Proc. Roy. Soc. Med.* 1930, March, 681.

HEART FAILURE.

A. G. Gibson, M.D., F.R.C.P.

T. Lewis¹ gives a very clear and well-written account of the early signs of congestive cardiac failure. The earliest symptom is breathlessness, and this must be estimated on a careful history of how the patient stands exertion to which he has hitherto been accustomed. In the latter stages breathlessness may occur on walking on the flat, and later it may be present at rest. In the last two stages only is there congestion in the venous system. This congestion can be measured by a manometer, but for clinical purposes it can be conveniently and simply measured by estimating a point above which the external jugular vein is empty in the reclining or semi-reclining position. The normal zero level of venous pressure is at the lower end of the manubrium sterni, which zero level persists in whatever position the patient may be. The method, therefore, is to strip the patient, let him be partly propped up with pillows, and to estimate the relation to this level of the column of blood in the external jugular vein. Various precautions must be taken to see that there is no obstruction by a faulty position or under muscular tension, or through sclerosis of the vein. In congestive failure this level is above that of the lower end of the manubrium sterni, and rises in proportion to the insufficiency of the heart muscle. The other important sign of congestive failure is enlargement of the liver.

REFERENCE.—*Brit. Med. Jour.* 1930, i, 849.

HEART AND PERICARDIUM, SURGERY OF.

A. Tudor Edwards, M.Ch., F.R.C.S.

Cardiolysis.—A further extension of surgical measures in cardiac disease has been suggested and practised by E. A. Graham.¹ As a result of cardiac enlargement which is of such a degree as to be embarrassed by the chest wall, two kinds of serious compressive effects may follow—those in the heart itself, and those in other thoracic structures. He reports operating upon two cases by resection of portions of the third, fourth, and fifth ribs and costal cartilages under local anaesthesia. The patients, a boy of 14 and a girl of 5, both showed temporary improvement, and it is important to note that in neither case was there evidence of adhesive pericarditis. Graham emphasizes the necessity for caution in evaluating the results, although the immediate effects were striking. [The caution is well justified, as both patients died very shortly after the presentation of the paper. The boy survived the operation for five months and died of cardiac failure, whereas the girl died from a typical right lobar pneumonia three months after operation, the cardiac compensation being well maintained until the last.—A. T. E.] Alexander Morison, of Edinburgh, is stated by Graham to have proposed the original operation in such cases, and the first operation was successfully performed on one of his patients by Stabb.

Acute Pericarditis.—For acute pericarditis, drainage is suggested by L. Grimault,² who records a case of infection by pneumococci. Recovery followed the operation, but it is instructive to note that the fluid withdrawn at the diagnostic aspiration was serofibrinous, although a day later the fluid was

definitely purulent. Lavage of the pericardium was performed at operation and at each subsequent daily dressing.

Chronic Pericarditis.—Adhesive pericarditis has been subjected to decompressive operations since it was proposed by Brauer in 1902 that a portion of the overlying rigid chest wall should be removed. P. D. White and E. D. Churchill³ draw attention to two types: (1) Those with cardiac adhesions to chest wall or diaphragm; (2) Constricting adhesions over the heart chambers and vessels. The former is the well-recognized adherent mediastino-pericarditis. The second or constrictive type prevents the entrance of blood through the veins and auricles into the ventricles. Only 37 operations for chronic constrictive pericarditis have been recorded, the procedure being termed 'pericardial decortication'. Five operations were not completed and there were 7 operative deaths. Marked relief occurred in 59 per cent of completed cases. The operation consists in free exposure of the pericardium and removal of a considerable area of the anterior surface, with division of constricting bands about the great veins. These authors record one case in which striking relief has been afforded by the operation.

Pneumopyopericardium.—An exhaustive account of this somewhat rare condition from the viewpoint of radiological diagnosis is given by J. F. Brailsford.⁴ In the preliminary remarks he states that it may be associated with: (1) Rupture of the pericardium by a foreign body in the œsophagus or stomach or by direct puncture; (2) Paracentesis; (3) Direct violence with or without fracture of ribs or sternum; (4) Artificial pneumothorax; (5) Breaking-down of an adjacent tuberculous lesion; (6) Rupture of adjacent purulent collections—abscess (lung, liver, empyema, subdiaphragmatic, etc.); (7) Carcinoma of œsophagus, bronchi, and stomach. From the description of the case upon which the paper was founded it would appear to be rather one of hydropneumopericardium than of pyopneumopericardium, although the spontaneous resolution of the condition was stated by the patient to be preceded by the vomiting of much foul-smelling matter. (*See also* X-RAY DIAGNOSIS.)

The Operative Treatment of Embolism of the Pulmonary Artery.—A. W. Meyer⁵ reports three cases of successful removal of massive emboli from the pulmonary artery. Two of them recovered completely and permanently, while the other patient died a month after operation from a new embolus stated to come from the other leg. At autopsy the sutures on the pulmonary artery were perfectly healed. Meyer also reports that two Swedish surgeons have each had two successful cases by his method. He considers that the effect of opening the left pleura which occurs in the operation devised by Trendelenburg has been responsible for the previous lack of success in this operation. In Meyer's modification the inner portions of the second and third ribs and costal cartilages are rapidly removed and a small portion of the sternum is chipped away. The mammary artery and the unopened pleura are pushed outwards and the pericardium is lifted by forceps, incised, and the opening digitally stretched. The sound is passed around the artery and aorta, the rubber tourniquet attached being drawn around deep to the vessels by the sound. Pulling on the tourniquet allows the vessels to be lifted upwards. The pulmonary artery is incised; loosening the tourniquet allows an outflow of dark blood and clots from the right ventricle. The tourniquet is then tensioned and forceps remove the clots from the right pulmonary branch. The incision in the artery is held by finger and thumb to allow circulation to go on for a few moments. The left pulmonary branch is then cleared in a similar manner. Small clamp forceps are placed upon the lateral wall of the pulmonary artery to exclude the opening, but allow the circulation in the vessels to continue while sutures are applied to close the opening. When

enough sutures are inserted to prevent any leak the pericardium and superficial structures are sutured.

REFERENCES.—¹*Ann. of Surg.* 1929, Nov., 817; ²*Bull. et Mém. Soc. nat. de Chir.* 1929, Dec. 7, 1290; ³*New Eng. Jour. Med.* 1930, Jan. 23, 165; ⁴*Brit. Med. Jour.* 1929, ii, 1053; ⁵*Surg. Gynecol. and Obst.* 1930, May, 891.

HEART IN RELATION TO SURGICAL OPERATIONS.

A. G. Gibson, M.D., F.R.C.P.

H. B. Sprague¹ discusses the question of the heart in relation to surgical operations, and he sums up what he assumes to be true as follows: (1) No type of heart disease is, *per se*, a contra-indication to necessary surgery; (2) There is considerable danger of complications and death with congestive heart failure; (3) Medical treatment of the heart previous to operation lessens the surgical risk; (4) Obese patients and those suffering from chronic sepsis are great risks; (5) The best clinical guides during and after operation are the rates of respiration and pulse, and the height of the blood-pressure; and (6) The skill of the anæsthetist and surgeon greatly influences for the better the chances of success. The author has studied 170 out of 284 cardiac patients: 24.7 per cent of the patients died suddenly during the operation. These included coronary thrombosis, syphilitic aortitis, obesity with acute myocarditis, degeneration, chronic rheumatic disease, and hypertension with obstructive jaundice. In 10 cases, however, no adequate cause was found at necropsy. The author then discusses the cause of post-operative deaths in various cardiac conditions. Age is a most important factor, and two-thirds of the deaths occur in patients over 50. It is sometimes said that cardiac patients do well under anæsthesia, but this paper shows that the risks are considerable and should be very carefully weighed.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1929, July, 54.

HEART, X-RAY APPEARANCES. (See also X-RAY DIAGNOSIS.)

A. G. Gibson, M.D., F.R.C.P.

G. J. Chandlee and E. Burvill-Holmes¹ studied the X-ray appearances from the cardiological point of view. They note that the right border of the normal heart has one curve, that of the right auricle; the left border has four—the arch of the aorta, the arc of the pulmonary artery, that of the left auricle and of the left ventricle; those of the pulmonary artery and left auricle are not differentiated. Pulsations of the heart are more apparent in forced inspiration than in any other phase. In hypertension an aortic shadow is more prominent than in the normal. In mitral stenosis the left border appears straighter because the angle usually seen above the ventricle is filled in by the dilated left auricle. When stenosis is marked there is often a clear bulging of the left auricle into this angle. Its appearance is to be differentiated from patent ductus arteriosus, in which the knuckle of the pulmonary artery is more prominent. In pericarditis with effusion the contour of the heart is more or less globular. Pulsations in individual parts are not seen so well. In chronic adhesive pericarditis the apex of the heart does not move normally, and on inspiration no angle occurs between the apex and the diaphragm. In aortic insufficiency due to syphilis there is a considerable deflection of the aorta as a whole. Aortic regurgitation can be distinguished from aortitis with dilatation. The aortic knuckle is found in these cases to be enlarged, and may merge with or obscure the pulmonary artery or auricle. The enlarged aorta can usually be confirmed by turning the patient into the right oblique position, which causes the shadow to disappear.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1929, Sept., 364.

HEART-BLOCK. (*See* ANGINA PECTORIS AND CORONARY ARTERY DISEASE; ARRHYTHMIA.)**HEELS, PAINFUL.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

A. H. Todd¹ points out that this is a fairly common complaint amongst orthopædic patients. The first thing to do is to localize the pain accurately. As a rule it is either beneath the heel, the point on which body weight is borne, or else behind the heel. If in the latter position, it is necessary to make certain whether the skin behind the tendo Achillis or the bursæ in that region are involved. The pain may be due to bone trouble. If the pain is underneath the heel in young patients, it will be found most often to be in the skin—the result of unsuitable footwear. Children will walk about unsuspectingly on a nail-head or a rucked-up lining of the shoe. In some cases plantar corns seem to be almost locally infective, numerous satellite corns forming around it. If the primary corn is excised and bleeds, these satellites are likely to arise. Exposure of the heel to **X Rays**, a single application, giving about half a pastille dose, seems to be uniformly successful.

It is difficult sometimes to distinguish between a corn and a wart, but if a thin slice be taken off with a razor, a wart will show a number of tiny bleeding points which are really divided capillaries. The nerve-endings are exposed

and are very tender when touched with a needle-point. Small warts may be cured by the application of **Carbon-dioxide Snow**. A blister forms and dries and comes away, bringing a large part of the wart with it. Another plan is to insert a very small crystal of **Monochloroacetic Acid** in the centre of the wart and leave it to bring about necrosis.

When high-heeled shoes of the 'Court' variety are worn, pain may be caused high up above the insertion of the heel tendon by the friction of an ill-fitting shoe. There are two bursæ at the heel which have a surgical importance; they are shown in *Fig. 36*. Inflammation and thickening of the superficial bursæ results in a rounded

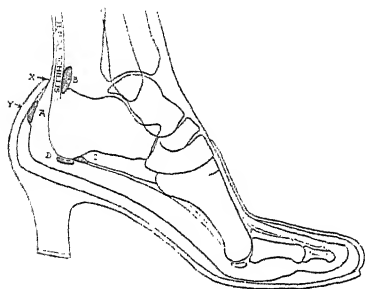


Fig. 36.—Painful points due to ill-fitting shoe. A, Adventitious superficial bursa; B, Normal deep bursa; C, Where heel-spur forms a long plantar ligament; D, Occasional bursa; X, Shoe rubs here; Y, Heel-strengtheners of shoe.

(Reproduced from the 'Practitioner'.)

or oval swelling, just deep to the skin, low down behind the heel and below the level of the insertion of the tendo Achillis. The second bursa lies deep to the tendo Achillis. When enlarged and viewed from behind a very characteristic swelling, rather like a butterfly's wings in shape, is noticeable. Crepitations may be felt from synovitis along the heel tendon. Rest and counter-irritation may be effective, but a simpler and more efficient method is to make a lateral incision deep to the tendo Achillis and dissect out the bursa entirely. The foot should be kept in plantar-flexion for about three weeks, and walking is then resumed. Sometimes this bursa is infected by tuberculosis, secondarily to disease of the ankle-joint.

In boys of 12 to 13 years of age chronic aching of the heel is not uncommon. If both heels are X-rayed the epiphysis of the os calcis at the site of the pain is found to be in several pieces, and the epiphysal line looks 'fuzzy'. This condition is comparable to the Schlatter-Osgood disease at the typical tubercle. If the symptoms are mild they can be relieved by relaxing the tendo Achillis

and raising the boot heel a quarter of an inch. It is well to warn the parents that very likely the other heel will become similarly affected. As the children become older the trouble invariably disappears. Rupture of the tendo Achillis requires prolonged immobilization in extreme plantar flexion; the best treatment is to suture the tendon, which always gives a perfect result.

Solitary cysts occur in various parts of the os calcis at all ages, but are most commonly found towards the posterior part of the foot. An X-ray examination reveals a clear circular patch in the weight-bearing part of the bone. These cysts may be due to fibrocystic disease, myeloma, tuberculosis, and even to sarcoma. The wisest plan is to explore the cavity and deal with it according to what is found. Persons aged 50 or more develop pain and tenderness at a spot which corresponds with the front edge of the tuberosity of the os calcis. In such a case heel-spur can be confidently diagnosed. In the experience of the reviewer these heel-spurs are very common. In young adults the commonest cause is gonorrhoea. Operations sometimes fail, especially if performed in the active stage. One must remember that these spurs are ossified white fibrous tissue due to infection in a number of cases. Too early operation has the same result as too early operation in myositis ossificans. As a post-operative or palliative measure a cushion must be provided under the heel, having a depression or a hole in the centre corresponding with the position of the spur. A pad of white felt in which a hole has been made is quite satisfactory.

REFERENCE.—¹*Practitioner*, 1930, March, 308.

HELIO THERAPY. (See PHOTOTHERAPY; TUBERCULOSIS, SURGICAL.)

HEPATITIS, AMŒBIC. (See AMŒBIASIS; LIVER, DISEASES OF.)

HEREDITARY ECTODERMAL DYSPLASIA.

Reginald Miller, M.D., F.R.C.P.

As three papers have appeared this year on this curious condition it seems to demand notice in spite of its rarity. It is one of those little-known abnormalities which is quite possibly not so rare as present records suggest. It was first described by Thurnam in 1842, and although it was discovered in this country, chief interest has been taken in it by workers in other lands. It shows a strong hereditary bias, and thus is almost confined to the male sex in incidence. A special class of the disorder, of which some seventeen cases have now been described, affects not only the teeth and hair and nails, but also the sweat-glands. The skin is glossy and smooth, and the total absence of the sweat-glands, and thus of perspiration, leads to great discomfort in hot weather. The teeth, which may be absent, may show almost any abnormality in number, form, and date of eruption, and their shape may be highly peculiar. The hair may be fine and sparse; the lanugo hair on the body may be absent; the outer third of the eyebrow is often suppressed; axillary and pubic hair may or may not develop; and the facial hair of adult life may fail to appear, except on the upper lip. Nipples and mammary glands may be rudimentary or absent, and in two cases the lacrimal glands were absent. For this class of case, it is suggested by Weech, the most satisfactory label is the 'anhidrotic type of hereditary ectodermal dysplasia', and two new cases have been described by J. Smith¹ in England and A. W. Falconer² in South Africa. The question of causation, which is as yet an unsolved problem, is discussed by these authors.

On the other hand, H. R. Clouston³ in Quebec describes a familial condition evidently related to the above but milder in form, and in certain families by

no means rare. The affected parts are chiefly the hair and nails, but the skin may be slightly affected and the sweat-glands to some extent. Clouston mentions that he has inspected no fewer than forty such cases and that they all occurred in one family. The condition occurs amongst the French-Canadians, and probably dates back to the early settlers in Canada. It is, however, a familial and not a racial disorder, since it occurs in the offspring of marriages between affected families and other races. In this form Clouston reckons there are probably no fewer than 6000 examples in America. The sexes here are about equally affected.

REFERENCES.—¹*Arch. of Dis. Child.* 1929, iv, 215; ²*Lancet*, 1929, ii, 656; ³*Canad. Med. Assoc. Jour.* 1929, July, 18.

HERNIA.

A. Rendle Short, M.D., F.R.C.S.

CAUSATION.—A Committee of the American Railway Association consisting of C. W. Hopkins,¹ of Chicago, and four other surgeons issued a report on the question of when a hernia may fairly be regarded as due to an accident and eligible for compensation. After reviewing a number of American legal decisions, they give their blessing to the following rules:—

“Rule 1.—Real traumatic hernia is an injury to the abdominal wall (belly wall) of sufficient severity to puncture or tear asunder said wall and permit the exposure or protrusion of the abdominal viscera or some part thereof. Such injury will be compensated as temporary total disability, and as partial permanent disability, depending upon the injured individual's earning capacity. [Such cases are rare.—A. R. S.]

“Rule 2.—All other hernias, whenever occurring or discovered and whatever the cause, except as under Rule 1, are considered to be diseases, causing incapacitating conditions of permanent partial disability, and the causes of such are considered, as shown by medical facts, to have either existed from birth, to have been years in formation, or both, and are not compensatory, except as provided under Rule 3.

“Rule 3.—All cases coming under Rule 2 in which it can be conclusively proved, first, that the immediate cause which calls attention to the presence of the hernia was sudden effort or a severe strain or blow, received while in the course of employment; second, that the descent of the hernia occurred immediately following the cause; third, that the cause was accompanied or immediately followed by severe pain in the hernial region; fourth, that the above-mentioned facts were of such severity that they were noticed by the claimant and communicated immediately to one or more persons—are considered to be aggravations of previous ailments or diseases, and will be compensated as such for time or loss only, depending on the nature of the proof submitted and the result of the local medical examination.”

According to W. W. MacGregor,² there can be demonstrated in both man and animals a sphincter at the internal abdominal ring, the relaxation or forcing of which gives rise to hernia. W. Birkenfeld³ points out that in certain families there is an inherited tendency to hernia, and that in these persons the recurrence-rate after operation is 11 per cent, as against a normal recurrence-rate of 4 per cent. Especial care is therefore necessary to avoid risks of stretching the scar after herniorrhaphy on such patients.

Inguinal Hernia.—

TREATMENT.—Treatment by **Injection** instead of operation appears to be having quite a vogue in Spain and in America just now. Mestre, of Barcelona, after twenty years of experimental trial, has hit upon a mixture of tinctures of **Catechu**, **Monesia**, **Krameria**, **Dog Rose**, and **Bilberry**, the active principle being **Tannic Acid** and **Alcohol**. The krameria is said to

PLATE XX

INGUINAL HERNIA

(V. SCHMIEDEN)

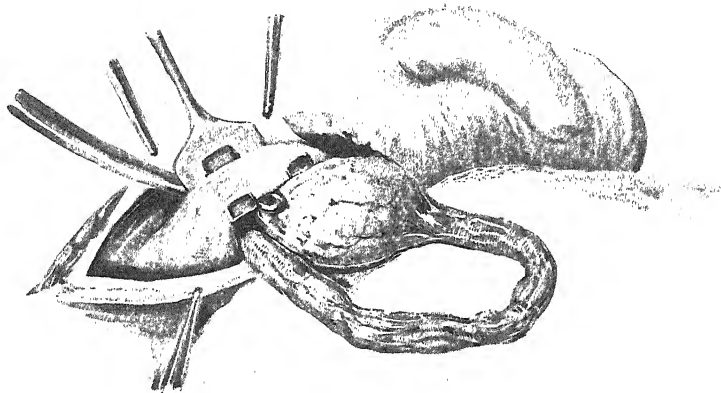


Fig. A.—A strip of the deep muscle (internal oblique and transversalis), a thumb's breadth wide, is separated, and a slit made. The spermatic cord with the testicle is pulled under this strip and through the slit as through a button-hole.

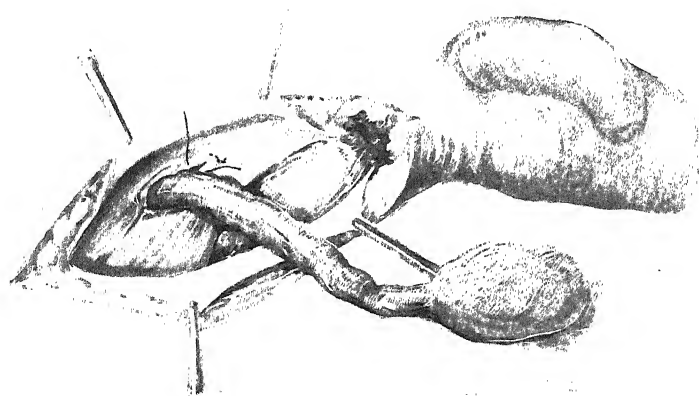


Fig. B.—The newly formed aperture for the spermatic cord is narrowed by a few sutures so that the cord is embraced fairly tightly.

*Plates XX and XXI by kind permission of
"Archiv für klinische Chirurgie"*

PLATE XXI

INGUINAL HERNIA—*continued*

(V. SCHMIEDEN)

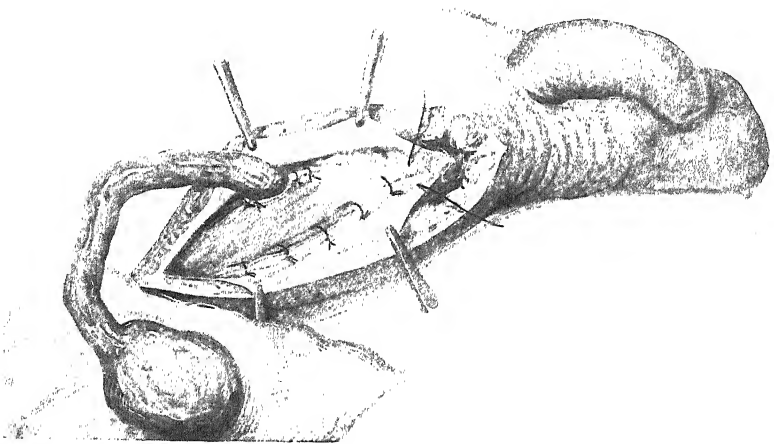


Fig. U.—The old hernial opening is obliterated by sutures, a solid wall being thus formed.

be the most important constituent. It is injected at the site of the external abdominal ring, from six to fifteen treatments being needed as a rule. Novocain may be injected first. The finger is introduced into the external ring as a guide to the needle, and the injection is given *very slowly*. The dose is from 1 to 5 c.c. of the tinctures. A truss must be worn all the time, night and day, during the treatment period. Pain and swelling may call for an intermission of the injections. The only contra-indications are hæmophilia and irreducible hernia. The patient need not lie up, and the cure is complete at the end of the fifteenth day as a rule. Mestre is said to have treated ten thousand cases, and the death-rate is nil. The good result is due to a barrier of adhesions. F. S. Jameson and J. Cantala⁴ have had 4 recurrences in 64 cases. J. S. K. Hall⁵ had 1 failure amongst 33 cases. The method may be used for children. It works well in cases of recurrent hernia. When we remember the scepticism with which the injection treatment of varicose veins was at first received by the profession, it would be unwise to refuse the slightest credence to these observations.

Operative Methods.—Noetzel,⁶ writing on the treatment of inguinal hernia in women, protests against the sacrifice of the round ligament, as likely to lead to torsion or prolapse of the uterus. In congenital hernia the extra-peritoneal portion of the ligament is entirely absent; the hernial sac contains the entire ligament, which is flattened out as its posterior wall. Instead of cutting fascial strips from the leg to repair a large-ringed or direct inguinal hernia, they may be obtained from the coverings of the sac itself, if big enough. The sac may be placed on the operator's finger like a finger-stall, and a long strip cut as one would peel an apple spirally (F. R. Brown⁷). E. M. Hodgkins⁸ cuts the strips from the sheath of the rectus abdominis, making four oblique incisions and obtaining three narrow strips thereby.

K. P. A. Taylor,⁹ of Guatemala, advocates the routine removal of the appendix through the hernial operation wound on the right side. He accomplished this in 96 per cent of his cases.

V. Schmieden¹⁰ has recorded a new operation for inguinal hernia. He exposes the sac and cord as usual, withdraws the testis entirely from the scrotum by pulling on the cord, twists and ties the sac at its neck, makes a slit in the internal oblique and transversalis muscles above the canal, and draws the testis and cord through it, replacing the testis in the scrotum. The canal can then be completely sewn up, and the aponeurosis of the external oblique folded and stitched over the whole region. [This method seems promising.—A. R. S.] (*Plates XX, XXI.*)

Epigastric Fatty Hernia.—P. N. Napalkow¹¹ has an article on that not uncommon and often overlooked condition called *hernia epigastrica occulta*. It may give rise to local pain, dyspeptic symptoms, or even strangulation, and operation is usually indicated.

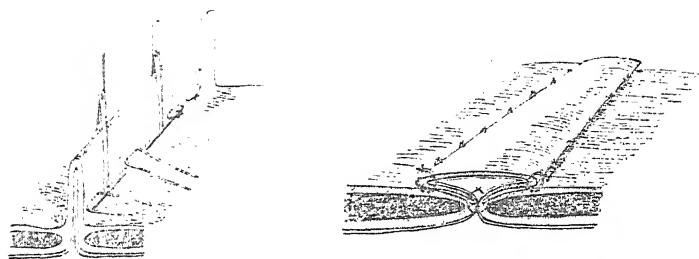
Diaphragmatic Hernia.—The diagnosis of diaphragmatic hernia is usually made by X rays, and in cases of acute obstruction this is likely to be omitted and the condition fail to be recognized before operation. A history of wound or injury to the chest associated with symptoms of gastric or intestinal strangulation is very suggestive. Pain and shock are apt to be severe. The heart is displaced to the right, and the left costal margin is fixed (F. S. Gibson¹²).

In a case in which the X-ray diagnosis between diaphragmatic hernia and eventration was in doubt, R. H. Overholt¹³ exposed and stimulated the phrenic nerve with a faradic current. The resultant contraction of the diaphragm was watched under the fluorescent screen.

R. L. Sanders¹⁴ reports four cases, two of which were operated on. One was traumatic, and did well; another was congenital and was operated on

at the age of 5 by the combined abdominal and thoracic routes; this patient also did well.

Divarication of the Recti.—For this condition M. B. Juckelson¹⁵ recommends a kind of reefing operation, well shown in *Figs. 37 and 38*.



Figs. 37, 38.—Reefing operation for divarication of the recti abdominis muscles.
(Re-drawn from 'Zentralblatt für Chirurgie'.)

REFERENCES.—¹*Ann. of Surg.* 1929, Dec., 1060; ²*Surg. Gynecol. and Obst.* 1929, Oct., 510; ³*Arch. f. klin. Chir.* 1930, March, 509; ⁴*Med. Jour. and Record*, 1930, Jan., 87; ⁵*Ibid.* 1929, July, 61; ⁶53 *Tag d. deut. Ges. f. Chir.* Berlin, 1929; ⁷*Brit. Med. Jour.* 1930, i, 858; ⁸*New Eng. Jour. Med.* 1930, April, 797; ⁹*Ann. of Surg.* 1929, Aug., 266; ¹⁰*Arch. f. klin. Chir.* 1929, Nov., 615; ¹¹*Ibid.* 1930, April, 627; ¹²*Jour. Amer. Med. Assoc.* 1929, Nov., 1719; ¹³*Ann. of Surg.* 1930, March, 381; ¹⁴*Ibid.* 367; ¹⁵*Zentralb. f. Chir.* 1930, May, 1215.

HERPES ZOSTER.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

J. S. Friedenwald¹ reports the case of a woman, age 47, who developed a severe herpes zoster ophthalmicus on the left side, with early corneal involvement and iritis. Five days after the onset of the cutaneous symptoms she was given an intramuscular injection of 8.5 c.c. **Blood Serum** of another patient, who had recovered six weeks before from herpes zoster. Five hours after the injection the patient was more free from pain than she had been since the onset of the attack, and by the next morning the oedema of the lids had markedly decreased. From this time the skin rash rapidly subsided; the iritis, however, was very stubborn. Post-herpetic neuralgia, with numbness and hyperæsthesia, persisted for two months; then vision recovered completely, a very unusual thing with such severe corneal involvement.

REFERENCE.—¹*Johns Hopkins Hosp. Bull.* 1929, Aug., 103.

HIP-JOINT, TUBERCULOSIS OF. (See TUBERCULOSIS, SURGICAL.)

HODGKIN'S DISEASE. (See LYMPHOMA.)

HOOKWORM DISEASE. (See ANKYLOSTOMIASIS.)

HYDROCELE. (See TESTICLE AND SCROTUM, DISEASES OF; VARICOSE VEINS.)

HYDRONEPHROSIS. (See KIDNEY, SURGICAL AFFECTIONS OF.)

HYPERCHLORHYDRIA. (See GASTRIC ANALYSIS.)

HYPER- AND HYPOGLYCÆMIA. (See DIABETES; ENDOCRINE TUMOURS.)

HYPERINSULINISM. (See DIABETES; ENDOCRINE TUMOURS.)

HYPER- AND HYPOPARATHYROIDISM. (See PARATHYROID GLANDS.)

HYPERPIESIA. (See BLOOD-PRESSURE, HIGH.)

HYPER- AND HYPOPITUITARISM. (See PITUITARY GLAND.)

HYPER- AND HYPOTHYROIDISM. (See GOITRE; THYROID GLAND.)

HYPERPYREXIA IN EARLY INFANCY DUE TO ATROPINE.

Reginald Miller, M.D., F.R.C.P.

The tolerance to atropine which is the rule in older infants and children does not apparently extend to very young babies of under one month of age. G. F. Munns¹ reports no fewer than six cases of hyperpyrexia in infants of this age. In them the amount of atropine given was between $\frac{1}{1000}$ and $\frac{1}{500}$ gr. The temperature rose to between 105° and 109°. It was accompanied by abdominal distension. Treated by **Hydrotherapy** the fever subsided in a few hours, and no harm eventuated. P. J. White² has reported the same phenomenon.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, July 20, 171; ²*Amer. Jour. Dis. Child.* 1929, xxxvii, 745.

HYPOCHLORHYDRIA. (See LIVER, DISEASES OF.)

ILEUS. (See INTESTINAL OBSTRUCTION.)

ILLUMINATION AND TRANSILLUMINATION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Cameron Surgical Lights ('*Surgillites*').—These instruments are made with great ingenuity for illumination during abdominal operations, for transillumination of the maxillary antrum or frontal sinus, or of cystic tumours, and for work with an ophthalmoscope or laryngoscope or post-nasal mirror. All these diagnostic lamps, boilable bulbs, and conductor cords withstand sterilization by boiling or steam pressure. Many surgeons, including the reviewer, sterilize the appropriate instruments as a routine in operative work. On more than one occasion, very small gall-stones have been seen in the common or cystic duct with the right-angle 'Surgillite' passed into the foramen of Winslow. When the stomach or duodenum requires to be opened in the search for ulcers, the lamp passed into the lumen of the gut or stomach beautifully illuminates the gastric and duodenal wall. Blood-vessels can be clearly visualized by transillumination in the omentum and mesentery during resection of the colon. The lamp is held by an assistant on the side of the mesentery remote from the surgeon. In operating for varicocele or hernia, the lamp held by the assistant in a similar manner will clearly show the vas deferens or hernial sac. The lamp should be held tight up against the structures which are to be illuminated.

In the case of absorption of B.I.P.P. recorded under **PIGMENTATION FROM BISMUTH ABSORPTION** the characteristic translucency of the blue stains in the gums could be well seen by means of the Cameron light. The lamp inserted into the rectum or vagina will illuminate the interior of the bladder during suprapubic cystotomy if the room is darkened. The lamp may be used for direct vision, but it is dazzling, and it is far more useful for transillumination purposes.

Transillumination is best employed where the area under examination is protected from all irrelevant light. This is the best form of light for transillumination of hydrocele, and the reviewer uses it in all cases of breast tumour that are not obviously malignant. The solid tumour stands out as a black

patch, the light penetrating surrounding tissues. In mixed cystic and malignant tumours both conditions can be differentiated.

J. C. Bloodgood¹ refers to transillumination as a diagnostic help in the case of blue-domed cyst in chronic cystic mastitis. He says that the blue-domed cyst is a definite gross pathologic entity. It cannot be mistaken for, or confused with, any other breast lesion. Clinically, in more than 98 per cent of the cases there are no definite signs of a malignant growth on the part of the skin or the nipple. In the large majority the palpable tumour is spherical and gives fluctuation, but this does not differentiate it from the cancer cyst and the papillomatous cyst. So far these blue-domed cysts have transilluminated clear. In a small percentage of the cases the blue-domed cyst is so buried in breast tissue that it cannot be differentiated, on palpation, from any other benign or malignant tumour. Transillumination promises help here. When one makes a frozen section of the wall of a blue-domed cyst, one may see the same histologic pictures which predominate in the diffuse papillary cystadenoma, or the encapsulated or non-encapsulated types of cystic adenoma. When women report in the early stages of breast lesions, the first difficulty is to find the definite lump for which operation is indicated. The second is to learn how to interpret the fresh frozen section of this lump when it is removed, because if it is not cancer the breast can be saved. If it is cancer, the complete operation for malignant disease should be done.

For the proper use of the Cameron lights the field must be dry. If there is bleeding, the use of these lights is, for obvious reasons, very much limited.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1929, Oct. 5, 1036.

IMPERFORATE ANUS. (*See* RECTUM, PROLAPSE OF.)

INDIGESTION. (*See* DYSPEPSIA.)

INDUSTRIAL DISEASES.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Pulmonary Fibrosis in Asbestos Workers.—E. R. A. Merewether^{1, 2} and C. W. Price¹ present an authoritative account of the causes and pathology of a 'new' industrial disease—pulmonary asbestosis. The essential lesion, which is caused by the inhalation of asbestos dust, is a chronic interstitial fibrosis, differing from the orderly whorled fibrosis in ordinary silicosis. The radiological appearances of the asbestos type of fibrosis are more delicate, softer, and more diffuse than those of the silicotic fibrosis. In the lungs of those exposed to asbestos dust, angular particles derived from asbestos and spicules of asbestos are found on microscopic examination, and also numbers of peculiar bodies, yellowish-brown in colour, of elongated bead-like form, and often with bulbous ends. W. E. Cooke³ and S. R. Gloyne⁴ independently demonstrated a mineral core in these bodies, evidently derived from the asbestos fibre. M. J. Stewart and A. C. Haddow⁵ have also demonstrated their presence in the sputum of asbestos workers. These bodies have not been found to occur in any other human affection. They have been found in the sputum within a comparatively short time after exposure to asbestos dust, and, in the absence of clinical or radiological evidence of pulmonary fibrosis, their presence cannot be taken at present as indicating anything more than previous inhalation of asbestos dust. Merewether considers that the risk of a diffuse pulmonary fibrosis developing in a person exposed to the inhalation of asbestos dust varies directly with the duration of exposure to the dust and is unaffected by the age of the worker. With continued exposures to high concentrations of dust, the disease may be fully developed in seven to nine years, and may cause death after about thirteen years' exposure, exceptionally in a shorter period.

Asbestos is a fibrous mineral, composed of silica combined with magnesium, iron, sodium, calcium, or aluminium. Its industrial value depends on the facility with which it can be split into long and flexible fibres for spinning and weaving, on its resistance to heat and acids, and on its insulating properties with respect to heat and electricity. The more dusty processes are those involving the preparation and manipulation of the raw asbestos, dry cloth making, and mattress making; the less dusty are spinning and similar processes. No reliable evidence is available to show whether there is any increased susceptibility to the supervention of pulmonary tuberculosis associated with the development of the asbestos fibrosis.

PROPHYLAXIS.—The preventive measures include both the suppression and control of the dust evolved in manufacturing processes, the education of the individual worker as to the nature of the risk, and periodical medical examinations. Asbestosis was recently brought within the scope of the Workmen's Compensation Acts.

Occupational Cancer.—The Senior Medical Inspector of Factories, J. C. Bridge, reports⁶ that 165 cases of epitheliomatous cancer due to industrial conditions were brought to light during the year 1929: 54 in cotton mule-spinners, 36 in tar distillers, 27 in patent fuel workers, and the remainder in industries where pitch and tar, paraffin, and mineral oils are used. These cases are detected earlier since the institution of periodical medical examinations in these industries. Owing to the slow onset many cases are not diagnosed until the patients have retired from work or passed into other employments.

I. Heller⁷ furnishes a valuable account of United States experience. He finds that the tar from gas-works and coke ovens is more dangerous than that from blast furnaces and producer gas. In the United States skin cancer amongst tar distillers is rare, since coke-oven tar is mainly used and it is less injurious than gas-works tar. It appears also that the negroes, who are employed in equal numbers with white men in these works, are highly resistant to skin cancer. Briquette workers frequently suffer from skin cancer in England, the chief risk being from the crushing and grinding operations, during which pitch dust is evolved. In the United States coal-tar pitch is little used and the whole process of briquette-making is more mechanized, which explains the absence of skin disease amongst briquette workers in that country. Mule-spinners' cancer, a serious risk in England, is virtually unknown in the United States. There is the same element of mechanical irritation in each case due to the repeated act of leaning against the faller shaft or the pulling of the overalls; but the American oil is apparently innocuous, although it comes into contact with the skin. Heller explains this as being due to the use of lubricating oils which have been drastically refined by the use of strong sulphuric acid. This removes the olefines and other unsaturated hydrocarbons which apparently are associated with or identical with the carcinogenic factors.

Arsenical Poisoning from Sheep-dipping.—I. Walker Hall and R. H. Ellis⁸ report on the death of a shepherd who died with symptoms indistinguishable from arsenical poisoning. He had been sheep-dipping twenty days previous to his death. The dipping solution contained 0.2 per cent of soluble arsenic. None of the men engaged wore overalls, gloves, or special garments. They were told individually not to allow the fluid to get on any sores or into their mouths, and were enjoined to wash their hands before eating. Water was provided for the purpose, but there was no soap, nailbrush, or towel. The symptoms were those of acute enteritis followed by death from cardiac collapse. About the same time the shepherd's dog died suddenly. Post-mortem examination showed that both the man and the dog died from

Bacillus aertrycke infection. Considerable amounts of arsenic were found in the man's organs. Elimination was proceeding via the kidneys and the wall of the large intestine, but not by the skin and hair. The authors suggest that, through the ease of occupational intake of arsenic, a tolerance had been established. Such tolerance appeared to be associated with certain histological appearances and a distribution of arsenic differing from those of homicidal poisoning. Practitioners in rural districts are acquainted with the abdominal, cutaneous, and nerve troubles which are attributed to absorption of arsenic in sheep-dipping. More care should be taken generally to protect sheep-dippers from this occupational risk.

Ethyl Petrol.—The final Report⁹ of the Departmental Committee appointed by the Minister of Health to inquire into the possible dangers to health arising from the use of this petrol, containing lead tetra-ethyl, reaffirms the conclusion that there are no reasons for prohibiting its use in this country, so long as adequate precautions are observed. No evidence was found that the settled dust in a garage where ethyl petrol was used for some cars contained more lead than the dust of other garages. Risks to health from the spilling of large quantities of ethyl petrol appear to be slight; if adequate ventilation exists, the risk from the spilling of small quantities appears to be negligible. It is improbable that pedestrians would inhale a dangerous quantity of lead when 'puffs' are blown out of the exhaust pipes of motor vehicles during the acceleration of their engines. The risk from the absorption of lead tetra-ethyl owing to the contact of ethyl petrol with the skin is so small as to be negligible. The Committee recommend that cans and pumps should be labelled to indicate the presence of lead in the fuel and to warn the user to avoid spillage and not to use the fuel for other purposes, that the fuel should be dyed, and that the amount of lead tetra-ethyl in the fuel sold for ordinary commercial purposes should not exceed 1 part in 1300 parts by volume.

REFERENCES.—¹*Home Office Report on Effects, etc., of Asbestos Dust*, H.M. Stationery Office, 1930; ²*Jour. of Indust. Hyg.* 1930, May, 198; ³*Brit. Med. Jour.* 1929, ii, 578; ⁴*Tubercle*, 1929, x, 404; ⁵*Jour. Pathol. and Bacteriol.* 1929, xxxii, 172; ⁶*Report of Chief Inspector of Factories*, 1929, H.M. Stationery Office; ⁷*Jour. of Indust. Hyg.* 1930, May, 169; ⁸*Lancet*, 1930, i, 448; ⁹*Report of Departmental Committee on Ethyl Petrol*, 1930, H.M. Stationery Office.

INFANTS. (See CHILDREN.)

INFECTION FROM BOOKS. *G. E. Oates, M.D., M.R.C.P., D.P.H.*

Sick persons are apt to console themselves with books, often with those from the public library. The question whether such books may convey infectious disease from one reader to another is of much practical importance. That certain pathogenic bacteria can live for some time outside the body is well known. The micro-organisms causing tuberculosis and diphtheria will survive drying for some days. The virus of small-pox is highly resistant to drying. There is little evidence available that the virus of diseases such as chicken-pox, measles, and rubella can survive outside the body for more than a brief period. The meningococcus is very easily destroyed outside the body. With streptococci the evidence is conflicting, most observers reporting that they will not survive drying for long.

Recent observations tend to show that the streptococcus of scarlet fever is more resistant. U. Friedemann and H. Deicher¹ found the scarlet fever streptococcus in the walls, beds, curtains, and other objects of a sick-room. A. R. Balmain² artificially infected books with *Streptococcus scarlatinae* and found that the organism survived for eighteen days even in lightly infected books.

It must be granted that for infection to be transmitted by books is a theoretical possibility; that it is a practical possibility is most unlikely. It is only rarely that infection can be traced to books in everyday life; and the general opinion of Medical Officers of Health is that, compared with the usual methods of spread, infection from books is of trifling importance. To disinfect a book is no easy task, and where the risk is appreciable, as with classical small-pox, it is safer to burn infected books. In the case of library books which have been handled by infectious patients, it is usual to expose them to formalin or other disinfectant vapour in a chamber. This procedure, which is only effective as regards the outsides of the books, serves to allay any nervousness on the part of the general public.

REFERENCES.—¹*Deut. med. Woch.* 1926, lii, 2147; ²*Lancet*, 1927, ii, 1128.

INFLUENZA.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—W. Hoffmann¹ illustrates the comparatively mild character of the influenza epidemic of 1928-9 by the fact that the mortality in the Berlin hospitals was only 7.5 per cent as compared with 10 per cent in the 1926-7 epidemic, 13 per cent in that of 1889-90, 15 per cent in that of 1891, 38.4 per cent in that of 1893, 23.6 in that of 1894, and 42.2 per cent in that of 1918.

L. Ginsburg² points out that important epidemics of influenza have occurred in Europe since the pandemic of 1918-19—namely, in the winter of 1921-2, at the beginning of 1924, and in the winters of 1926-7 and 1927-8. The average mortality in these epidemics was higher than that of the influenza epidemics in the period 1901-17. Ginsburg maintains that certain races, such as the Anglo-Saxon, are more susceptible to influenza than others. Women generally, and particularly in France, are more frequently attacked than men. Lastly, the mortality in country districts is higher than in towns, probably owing to defective hygiene and delay in summoning medical assistance.

SYMPTOMS AND COMPLICATIONS.—In a thesis on *influenza in the aged* P. Thibault,³ who states that epidemics of influenza have occurred yearly at the home for the aged at Angers, describes the outbreaks as being very severe, the mortality ranging from 28 to nearly 70 per cent. The onset is occasionally sudden, but is usually insidious. Respiratory symptoms dominate the scene, though the physical signs are at first very slight. Constitutional disturbance is usually very severe. A fall of temperature occurs after an aggravation of the general condition, but there are frequently one or more recurrences of fever four or five days later. In bedridden paralytic patients the onset of influenza is very gradual and the disease is liable to be complicated by bed-sores. In cardiac cases loss of compensation or œdema of the lung may occur either as a complication or as a mode of onset. A dry tongue, intense dyspnoea with rapid superficial respirations, dark and scanty urine, delirium, especially of a quiet kind following a condition of restlessness, and the development of bed-sores are unfavourable signs.

According to A. S. Hyman,⁴ who records nine illustrative cases, *angina pectoris* is a not uncommon sequel of influenza in the middle-aged. There is apparently no relation between the duration of the influenzal attack and the time of the onset or the character of the anginal seizures. The electrocardiogram is the only method for determining the extent and severity of the myocardial change.

G. Dalla Torre and A. Chinaglia⁵ have collected five cases of *acute influenzal polyneuritis* including the following personal case. A man of 40 was admitted to hospital with tetraplegia of sudden onset, high fever, and pronounced asthenia. Death took place after about a fortnight's illness. Post mortem

the lower lobe of the left lung was found to be consolidated, but the brain, spinal cord, and peripheral nerves appeared normal to the naked eye. On histological examination, however, typical well-marked parenchymatous neuritis was found in the sciatic, popliteal, median, and ulnar nerves, the lesions being similar to those recorded by previous observers.

K. A. Menninger⁶ illustrates the *improvement of mental disease by influenza* with a record of 18 cases in both sexes of various psychoses of from twelve months' to fifteen years' duration, including mania, melancholia, schizophrenia, and epilepsy. Eleven were completely cured, 3 showed some improvement, and 4 a remission of their mental symptoms, after their attack of influenza.

F. Cramer⁷ relates how after a severe attack of influenza he developed *dysgeusia*, i.e., various articles of food and drink which had formerly been pleasant became extremely disagreeable and distasteful to him. Such a sequel of influenza has not hitherto been described.

According to J. Romant,⁸ influenza plays a much more important part in the causation of *appendicitis* occurring in the winter months than is generally realized. The symptoms resemble those of gastro-intestinal influenza, consisting of colic, tenesmus, meteorism, bilious vomiting, and intestinal cramp, which may be so severe as to resemble cholera. Spontaneous pain is diffuse and situated in the umbilical region, but tenderness is most marked in the right iliac fossa. The co-existence of *oöphoritis* can be confirmed or excluded by rectovaginal examination. Purgation is dangerous, but a rectal injection which increases the cæco-appendicular pain is a safe guide. Romant records three personal cases in patients of 14, 33, and 52 years, who all recovered after operation.

V. Boganovitch⁹ records five cases of *erythema nodosum* following an attack of influenza in children of from 3½ to 7½ years. Tuberculosis, which some regard as responsible for *erythema nodosum*, was excluded as the Pirquet reaction was negative in each case. Influenza, therefore, was probably the predisposing if not the exciting cause of the eruption.

REFERENCES.—¹*Deut. med. Woch.* 1929, 1293; ²*Thèse de Paris*, 1929, No. 215; ³*Ibid.* No. 378; ⁴*Jour. Amer. Med. Assoc.* 1930, xciv, 1125; ⁵*Policlínico* (Sez. Med.), 1930, 9; ⁶*Jour. Amer. Med. Assoc.* 1930, xiv, 630; ⁷*Deut. med. Woch.* 1930, 1057; ⁸*Monde méd.* 1929, 954; ⁹*Arch. Dis. Child.* 1930, v, 56.

INTESTINAL OBSTRUCTION.

A. Rendle Short, M.D., F.R.C.S.

Physiology of Ileus.—By ileus we mean intestinal distension and paralysis without mechanical obstruction. Tyrrell Gray¹ describes two types: (1) *Active*, due to a reflex through the sympathetic nervous system inhibiting peristalsis, well seen in acute appendicitis; (2) *Paralytic*, due to rising venous pressure in the bowel wall and consequent passage first of gases, then of fluids, into the lumen of the bowel. In active ileus it is useless to give aperients until there are signs that the bowel is recovering its activity, such as audible peristalsis heard with the stethoscope, or the passage of flatus. In the paralytic type **Radiant Heat** should be applied to the abdomen. The stomach should be washed out. **Morphia**, not a purgative, is indicated. In severe or dangerous-looking cases a **Spinal Anæsthetic** will induce a free action of the bowels, or a temporary **Enterostomy** may be made. E. F. Müller² writes to much the same effect.

Enterostomy.—F. T. van Beuren, jr.,³ shows that the life-saving value of this procedure in cases of ileus can be demonstrated by statistics, and the improvement is not merely due to treating cases earlier. Tyrrell Gray mentions that after an initial gush of intestinal contents no more may flow for a day or two, which may give needless anxiety to those in charge.

Sodium Chloride Injections.—R. S. Anderson and R. Rockwood⁴ believe

that the intravenous injection of 5 or 10 per cent **NaCl** solution in freshly distilled water has reduced the operation mortality for intestinal obstruction by half. They add 10 per cent **Glucose** to the solution, and give 500 c.c., preferably *before* operation.

There is a considerable amount of French literature on the subject (Gosset,⁵ Legueu,⁶ Denis,⁷ Courty⁸). All agree as to the value of the method. Denis says it is much more effectual for a high small-gut obstruction, with incessant vomiting, than for low-down colon cases. He uses smaller injections, 20 to 40 c.c. of 20 per cent saline, and repeats them.

Enterospasm.—Most surgeons have had the experience once or twice of opening an abdomen on what appeared to be a clear diagnosis of acute intestinal obstruction, only to find one or more lengths of gut, usually over an inch or two, in tight spasm. Under deep anæsthesia this may disappear. Large or small intestine may be involved. The attacks may recur, and are relieved by **Atropine** or **Morphia**. L. M. Zimmerman⁹ presents a study of the condition, under the name of *spastic ileus*. Numerous causes are suggested—small gall-stones, worms, hard articles of food, injury, bleeding, operation, hysteria, etc. Diagnosis is impossible, in a first attack, without operating.

REFERENCES.—¹*Brit. Med. Jour.* 1930, i, 1161; ²*Mitteil. a. d. Grenzgeb. d. Med. u. Chir.* 1929, xli, 417; ³*Ann. of Surg.* 1929, Sept., 387; ⁴*Surg. Gynecol. and Obst.* 1929, July, 48; ⁵*Presse méd.* 1930, Feb., 249; ⁶*Bull. et Mém. Soc. nat. de Chir.* 1930, March, 412; ⁷*Presse méd.* 1929, Nov., 1527; 1930, Feb., 203; 1930, July, 906; ⁸*Bull. et Mém. Soc. nat. de Chir.* 1930, April, 475; ⁹*Surg. Gynecol. and Obst.* 1930, April, 721.

INTESTINES, SURGICAL AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Rupture from Compressed Air.—In some industrial occupations jets of compressed air are used, and a fair number of cases have been reported, especially in America, in which the application of the nozzle to the anus has resulted in rupture of the bowel. Usually the patient has been the victim of a cruel practical joke; sometimes the jet has been used to dust the clothes. The abdomen becomes greatly distended with air, and there is violent pain and collapse, perhaps also cyanosis. Death may follow in a few minutes. The best treatment is to insert a tube into the rectum and to tap the abdomen. Some relief having been given thus, **Laparotomy** is performed, and any laceration of the colon repaired. Quite half the cases die (D. C. Patterson¹).

Cancer of the Small Intestine.—Only 0.062 per cent of cancers of the alimentary canal affect the small gut, according to F. W. Rankin and Charles Mayo, jr.² The symptoms are those of intermittent obstruction and anæmia, lasting usually about a year till the patient is seen. There may be a rather characteristic tender mass that slips away under the fingers. Occult blood is generally present in the stools. Skiagraphy is only helpful in excluding other conditions. The best treatment is **End-to-end Resection**, but the prognosis is poor.

REFERENCES.—¹*New Eng. Jour. Med.* 1930, Jan., 118; ²*Surg. Gynecol. and Obst.* 1930, June, 939.

INTRACRANIAL HÆMORRHAGE. Geoffrey Jefferson, M.S., F.R.C.S.

Apart from the common apoplectic hæmorrhage from one of the striate vessels which takes such a heavy toll of life every year, there are other interesting forms of intracranial bleeding less well known. One of these, often occurring in young people, is the result of the bursting of a congenital aneurysm, an inborn weakness at some small point in the wall of the cerebral vessels, often in one of those composing the circle of Willis. These aneurysms are of small size, definitely non-syphilitic, and rarely give rise to symptoms before they leak.

The first hæmorrhage may be the last, a fatality rapidly ensuing, but at times the initial hæmorrhage may be recovered from and may be repeated later. The vessel being a surface one, the blood is injected into the subarachnoid space and not into the cerebral tissues, hence the hemiplegia of the more common intracerebral rupture of old persons does not occur. Instead, the patient complains of violent pain in the head, and rapidly becomes unconscious. As many—indeed, most—of these subjects are young and healthy, the doctor hesitates to diagnose a cerebral hæmorrhage as the cause of the sudden catastrophe. The patient may regain consciousness, complain of bursting headache for many days, and finally recover, but the ultimate prognosis is grave. The diagnosis is clinched by lumbar puncture, which reveals a heavily blood-stained fluid. There is the possibility, however, that the doctor may be doubtful in his own mind whether he has produced the bleeding himself, unless he is aware that a blood-stained fluid is far more often the result of natural processes than of puncture injury. Blood is not seen in the cerebrospinal fluid of the middle-aged apoplectic, the clot remaining confined within the substance of the brain. Our knowledge of these vascular calamities of youth has been steadily enlarging during recent years, especially through the work of C. P. Symonds¹ in this country. Recent papers by J. McIver and G. Wilson² and by A. J. Hall³ review the subject. The former stress the importance of syphilis, arteriosclerosis, and mycotic processes as causes of the condition; but here they seem to err, for the most interesting point in this condition is that the vessels are generally healthy. It is interesting to note how slowly it was recognized that the blood in the subarachnoid spaces in these cases was caused by actual vessel rupture. Terms such as 'acute hæmorrhagic' or 'apoplectic meningitis' were invoked to describe and explain the findings. One is reminded of the hæmorrhages from the intact gastric mucosa which have been alleged to account for hæmatemesis, though the pathology of the two types of bleeding (meningeal and gastric) is not parallel. There is this, however, to be said for the diagnosis of meningitis in cases of ruptured aneurysms—that injection of the subarachnoid spaces with blood causes the same pain, rigidity, positive Kernig, and so forth as are met with when it is septic exudates rather than blood that occupy these spaces.

It has been remarked that these aneurysms often give rise to no symptoms before they rupture, and this is true as a generalization. But when the aneurysm is on the posterior communicating or posterior cerebral at its origin from the circle of Willis it may cause an ocular palsy; almost always the nerve involved is the oculomotor, paralysis of which causes ptosis and paralysis of most of the movements of the eyeballs. The onset of this paralysis is often sudden, presumably from the dilatation of an already existing aneurysm or the blowing-out of a weak spot on the wall. From the writer's own experience it would seem that a small aneurysm is the commonest cause of isolated third-nerve paralysis. A. O. Pflingst and R. G. Spurling⁴ have recently recorded two such cases, but they are really far from uncommon, although the cause is apt to be unrecognized. In some cases of sudden unconsciousness from leaking of the aneurysm, the clinical picture of which has just been discussed, the patient may recover with a third-nerve palsy which was not there beforehand. Such cases are easily diagnosed correctly. The more difficult ones are those in which the palsy suddenly appears without any particular disturbance other than vague headache. Sometimes the muscles recover spontaneously, but there is always the danger of an overwhelming hæmorrhage later.

Hæmorrhage into Gliomas of the Brain.—One of the most firmly rooted of our beliefs is that gross hæmorrhages often take place into gliomas and that this happening is a fertile source of coma and death. The diagnosis is often

enough made, but necropsy fails to confirm it in the majority of cases, and although a tumour is present there is no special cause to be seen to account for the sudden fatality, no sign of any sudden alteration of a state of affairs that had clearly been slowly progressive for some time. Foraminal herniation, the crowding of the medulla and cerebellar tonsils down into the foramen magnum, is often recognizable, especially with tumours in the posterior fossa; but this mechanism does not often so clearly apply when the tumour lies in the hemispheres. The brain is commonly noted to be very bulky when exposed in these cases, and histological examination shows that generalized œdema is present, and it seems to be this which turns the scale. Œdema is certainly a much commoner finding than a gross hæmorrhage, though this latter does occur at times. Small hæmorrhages, often microscopic, are generally to be found in gliomas; the rarer occurrence is the erosion of a vessel large enough to cause death by suddenly increasing the volume of the tumour. Since it is clear that reactionary œdema is the chief cause of the sudden worsening of glioma patients, the inference for treatment is clear—hypertonic solution intravenously. The best substance for this purpose is 50 c.c. of 50 per cent pure **Glucose** intravenously; rectal magnesium sulphate in saturated solution is disappointing as it is not well retained.

It is not surprising that angiomatous tumours of the brain should cause relatively more intracranial hæmorrhage than do the gliomas. These tumours have been intensively worked upon lately—by H. Cushing and P. Bailey and by Lindau (see LINDAU'S DISEASE). The angiomatous cyst of the cerebellum, of which Lindau has written, does not itself cause gross hæmorrhage. It is more often an angioma of the cortex or elsewhere which is at fault. R. J. Reitzel and P. Brindley⁵ describe the case of a young man previously in perfect health admitted to hospital and dying six hours later. The clinical picture was that which we have described above as typical of the ruptured congenital aneurysm, but post mortem disclosed the fact that there was an angioma in the frontal horn of a lateral ventricle and that the bleeding had come from there. We must therefore bear this possibility in mind as an alternative to aneurysm as a cause of sudden unconsciousness, and as blood would be found in the lumbar-puncture fluid if the tumour was cortical or ventricular, it would be difficult to differentiate the sources ante mortem. Aneurysms are certainly commoner than angiomas, and that helps us to assess probabilities. W. E. Dandy⁶ has described a number of admirable examples of these tumours, and more especially of arteriovenous aneurysms of the cortex, in a beautifully illustrated paper. He mentions one case in which the patient died on the way to the operating-theatre, an exploration for brain tumour having been planned. Necropsy showed that there was a cortical angioma over the angular gyrus.

REFERENCES.—¹*Quart. Jour. Med.* 1924, xviii, 93; ²*Jour. Amer. Med. Assoc.* 1929, July 13, 89; ³*Brit. Med. Jour.* 1929, i, 1025; ⁴*Arch. of Ophthalmol.* 1929, ii, 391; ⁵*Amer. Jour. Med. Sci.* 1929, Nov., 689; ⁶*Arch. of Surg.* 1928, xvii, 190.

INTRACRANIAL TUMOURS. (See BRAIN, TUMOURS OF; LINDAU'S DISEASE; PITUITARY TUMOURS; TUBERCULOSIS OF CENTRAL NERVOUS SYSTEM.)

INTRAVENOUS MEDICATION. (See PRE- AND POST-OPERATIVE TREATMENT.)

ISCHIORECTAL ABSCESS. *J. P. Lockhart-Mummery, F.R.C.S.*

These abscesses are chiefly of importance because they so frequently result in the formation of anal fistulæ. Like all other abscesses, they are due to infection of the tissues by micro-organisms, which have obtained entrance either

through an abrasion or via the blood-stream or lymphatics. They are sometimes due to foreign bodies, such as fishbones or splinters of wood which have been swallowed and have punctured the wall of the rectum just above the sphincter. A great many abscesses are due to infection of the intramuscular glands which pass from the rectum into the apex of the ischiorectal fossa. A few cases are due to direct injuries and sometimes to tubercle. The proportion of tuberculous fistulae is not more than 18 per cent. The most common infective organisms are the *Bacillus coli*, ordinary streptococci, and *Str. faecalis*. There is often a very mixed infection. Gas-forming organisms are not uncommon, and frequently give rise to the impression that the abscess communicates with the bowel when as a matter of fact it does not do so.

A point of great importance with regard to these abscesses is that they may reach a very large size before there are any very obvious signs on the surface. The skin in this neighbourhood is tough and there is no deep fascia beneath it, consequently an abscess will spread throughout the ischiorectal space and pass across behind the rectum to the opposite side before any marked bulging on the surface appears. An ischiorectal abscess should always be suspected when the patient complains of pain and discomfort and there is found to be any induration or thickening at the side of the anal opening. Directly an abscess is suspected it should be opened. On no account should it be temporized with until it is pointing, or treated by fomentations and hot baths, as the only chance of saving a subsequent fistula is to open the abscess at the earliest possible opportunity. By the time it has reached a sufficient size to point on the surface it is almost certain that a fistula will be unavoidable. A stab with a knife into the ischiorectal fossa under a local anæsthetic will, by relieving tension, prevent the abscess from spreading, and often save months of subsequent trouble. These abscesses always start on one side of the bowel, and the pus rapidly finds its way round to the opposite side, so that if the trouble is not detected early it is quite possible it will involve both ischiorectal spaces. It cannot be too much insisted upon that there is often very little evidence externally of the fact that a large abscess exists in this situation. If one finger is introduced into the rectum and the tissue palpated between this finger and the thumb outside on the skin, the presence of an inflamed area cannot well be missed.

Once an abscess is diagnosed it should be opened with the utmost possible dispatch the same day, or within a few hours if possible. This can be done under gas and oxygen or under a local anæsthetic if necessary. A free incision should be made into the middle of the ischiorectal space well away from the anal canal and a finger passed into the abscess cavity. The skin overlying the cavity should then be cut away so as to leave a large opening. The inside should not be curetted, or even washed out, but, after stopping any squirting vessels, should be treated with a large flat antiseptic compress without inserting any packing or drainage-tube into the wound. It has been found that abscesses treated in this way heal up far more rapidly and with much less liability to a fistula than if they are packed or drainage-tubes are inserted. It is better not to wash out the cavity of the abscess, but just to see that drainage remains perfect. The introduction of a finger into the rectum each day to press on the inner wall of the abscess is often of great assistance. If there are signs that the opposite ischiorectal fossa is already involved, the abscess on that side should be opened at the same time and in the same manner. If the abscess is opened promptly in the manner suggested, healing will occur in quite a number of cases without the formation of a fistula. In a great many instances, however, a fistula does follow an ischiorectal abscess.

On no account should the fistula be operated upon at the time of opening

the abscess. The latter should be allowed to drain freely for ten days to a fortnight, and it will then be found that a track exists which is preventing the permanent closure of the opening. At this stage the fistula should be operated upon and laid freely open, if necessary into the bowel. In most cases the external opening of the fistula will be in the mid-line at the back, but in a few instances it may be in the front. It is very rare for there to be more than one external opening however numerous the external tracks. If there is reason to believe that an internal track passes deep to the internal sphincter, it should not be laid open at the original operation, but all the other tracks should be divided and the division of the sphincter left until the lateral wounds have healed as far as they can. By doing the operation in this way, in two stages, the risk of incontinence resulting from the operation can be avoided. After the first twenty-four hours the patient should be made to sit in a hot antiseptic bath for twenty minutes to half an hour twice a day, and the external wound should be dressed with antiseptic compresses. The interior of the abscess is best left absolutely uninterfered with.

Abscesses in this neighbourhood may, of course, be due to perforation of the urethra or to suppurating pyosalpinx, necrosis of the pelvic bones, or abscesses of the prostate. Such abscesses should, of course, be drained, but the subsequent treatment of the condition must be left to a specialist, as they often present very considerable difficulties.

JAUNDICE, HÆMOLYTIC.

Ivor J. Davies, M.D.

J. M. Baty¹ (Boston) reports a case of congenital hæmolytic jaundice with an unusually high percentage of reticulocytes present over a long period of observation. The reports in the literature indicate that the number of immature cells occurring during the course of congenital or acquired hæmolytic jaundice rapidly returns to normal following **Splenectomy**. Two years after removal of the spleen the blood of this patient showed reticulocyte counts of 30 to 70 per cent. Although improved, he had not been cured by the operation, and the persistent increase in the percentage of immature red blood-cells may be interpreted, together with the persistence of jaundice and anæmia and the occurrence of hæmolytic crises, as an additional indication of continued activity of the disease process.

G. F. Reynolds² (Boston) reports a case of acquired hæmolytic jaundice with unusual features and improved by splenectomy. A young man admitted to the hospital after seventeen months of continuous jaundice presented a marked icterus and a considerable degree of secondary anæmia with unusually active blood regeneration. A diagnosis of acquired hæmolytic jaundice was made, and splenectomy was performed with striking improvement in the icterus, the anæmia, and the patient's general condition. Three years after operation the patient appears to be clinically well.

C. S. Yang³ (Peiping) reports the first recorded case of hæmolytic jaundice in a Chinese patient. The clinical picture was characteristic, and improvement followed splenectomy. When the blood was examined three years after splenectomy it showed thrombocytosis, lymphocytosis, some improvement in the fragility of erythrocytes, and microcytosis.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, April, 546; ²*Ibid.* 549; ³*Nat. Med. Jour. of China*, 1929, Dec., 795.

JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—According to A. Wallgren,¹ during the period 1900–27 inclusive 1398 cases of catarrhal jaundice were notified in the Gothenburg district, the annual number ranging from 9 to 79 until 1925, when it rose

to 365, falling in the following year to 125, and in 1927 to 71. As the district medical officers who had to notify the cases formed barely a quarter of the practitioners who were likely to see cases of catarrhal jaundice, these figures by no means indicate the exact number of cases which occurred. The increased incidence of jaundice in Gothenburg in 1925-6 was simply a manifestation of the pandemic of jaundice which appeared about the end of the War, reached its height in Germany in 1919-20, and then spread almost all over the world. The Gothenburg epidemic was not due to *Leptospira icterohæmorrhagiæ*, as examination of the blood, urine, and faeces invariably yielded a negative result.

Schüffner² states that of 46 cases of Weil's disease examined at the Institute of Tropical Hygiene at Amsterdam since 1924, 10 were fatal. The majority occurred in the months of August (5 cases), September (11 cases), and October (5 cases). There were 3 cases in December and 3 in January, when contact with open water, the principal etiological factor, is least likely to take place. In 20 cases there was a history of a fall, accidental or suicidal, into water, and in most instances the patients had been immersed for some time. In 7 cases there had been a history of swimming, and 5 patients had been in constant contact with water, while 13 gave no clue as to how they had contracted their infection. As regards the distribution of the cases, Amsterdam and Rotterdam showed the highest incidence with 15 and 16 cases each, and, generally speaking, the disease was more prevalent in the water district than in the meadow land.

W. N. Pickles³ records an outbreak of epidemic jaundice in the North Riding of Yorkshire, where more than 250 cases occurred among a population of only 5700 between October, 1928, and October, 1929. The method of spread was probably respiratory. Examination of nasopharyngeal swabs, blood, and urine was negative. Of 118 patients attended by Pickles 40 were above school age—a higher proportion than in previous epidemics. The usual period of invalidity in insured cases was three or four weeks. There were no fatal cases, but in some instances severe acute abdominal disease was simulated.

SYMPTOMS.—G. C. van den Heuvel⁴ reports a case of *Weil's disease without jaundice*. The patient was a boy, age 11, who, after swimming in a bath where water was connected with that of a slaughter-house, was seized with vomiting, fever, severe headache, and general malaise. There were no physical signs apart from slight abdominal tenderness. The fever remained high and the headache severe. The patient also had herpes labialis, enlargement of the liver and spleen, and considerable conjunctival injection, but there was no jaundice and the urine was normal. Examination of the blood, however, showed an agglutination of *Leptospira icterohæmorrhagiæ* in a dilution of 1-2500. *Leptospiræ* were also found in the urine of experimental animals. Apart from the abdominal symptoms, there was no pain in the muscles, and there was no eruption. Recovery was uneventful, the temperature becoming normal on the eleventh day.

REFERENCES.—¹*Acta Pædiat.* 1930, ix, Suppl. II, 1; ²*Nederl. Tijds. v. Geneesk.* 1929, 4708; ³*Brit. Med. Jour.* 1930, i, 914; ⁴*Nederl. Tijds. v. Geneesk.* 1929, 4791.

JOINTS, TUBERCULOUS. (See TUBERCULOSIS, SURGICAL.)

JUVENILE INFECTIONS, DIATHESIS IN.

Reginald Miller, M.D., F.R.C.P.

Although so often debated, the question of inherited predisposition to disease remains ever a fascinating problem. Certain diseases there are which adhere so closely to family incidence that they can actually be quoted as examples of Mendel's laws. Infections are not of this group; in them there is ample scope

for argument about the relative significance of the 'seed' and the 'soil'. The problem resolves itself into two main questions: (1) Is a child coming from a stock showing a high family incidence of an infection predisposed to acquire that disease on account of an inherited diathesis? and (2) If it does so acquire it, is it predisposed to a specially poor resistance to the infection? Various difficulties complicate the problem. For instance, in a contagious disease like tuberculosis, a high family incidence often means increased opportunity for the child to acquire the disease by direct contact with the infecting micro-organism; while in an environmental disease like juvenile rheumatism, it may be that the faulty environment which has affected the parents is also operating in the case of the child.

In order to study these problems, no better example can be taken than that of tuberculosis. Here the infecting agent is known, and it can be traced whether the child is living in abnormally close contact with it. Further, we have tests which can tell us, with probably a constant margin of error, whether or not the child is infected with the tubercle bacillus, even though it cannot be said to be 'suffering' from tuberculosis. It is true that tuberculosis is a common disease and that environment does play some part in its production, but these disadvantages do not outweigh the positive advantages already mentioned. B. Schlesinger and P. D'A. Hart¹ have studied afresh the whole problem of the relative importance of heredity and contagion in the non-bovine tuberculosis of children, and they have based their most careful work on the influence of exposure on tuberculous infection (as shown by the intracutaneous test of Mantoux) as opposed to manifest disease. They have necessarily followed statistical methods, but throughout have been careful to control their results by comparison with normal children. They found that positive tuberculin reactions were more frequent among children of tuberculous households than among those whose homes were free from tuberculosis; and that children living with a tuberculous parent or sibling showed tuberculin reactions more frequently than those with tuberculous relatives who did not live with them, and the latter more frequently than children with no tuberculous relatives. Also they found a larger percentage of positive reactors among children living with a relative suffering from open tuberculosis than when the tuberculosis was closed. These results they regarded as adequately explained by variation in frequency, intimacy, and duration of contact, without assuming the existence of inherited predisposition. In an attempt to get down to the bottom of the matter these authors went a step further. They examined the tuberculin reactions of a series of children living with relatives suffering from non-pulmonary tuberculosis, and found that reactors were no more common amongst them than in children of non-tuberculous households or with no tuberculous relatives. It is not easy to find a sufficiency of cases which would be suitable for this last comparison, and unfortunately the numbers quoted by the authors under this heading are too small to be entirely conclusive, but they state that, in their opinion, should further work embracing a larger number of cases confirm their results, the view that children of tuberculous ancestry inherit a predisposition to tuberculous infection will be rendered untenable.

The problem of an inherited predisposition to juvenile rheumatism is beset with rather different difficulties. There is no doubt that the older authors, great authorities like W. B. Cheadle, were in the habit of emphasizing the family influence in this disease. Of recent years the truth of this conception has been called in question. In the first place, it is extremely difficult to get an accurate history of real acute rheumatism in the families of the poor, and we have no right to include the various types of chronic rheumatism, since their relationship to acute rheumatism is not established. Secondly, acute

rheumatic infection is an extremely common disease amongst the children of the poorer classes; common enough to turn up in several members of a family and in more than one generation merely out of coincidence. Thirdly, in the large-scale production of the disease it is now clear that social conditions (environment) play an important part, and these are likely to operate on parents and children alike. During the last few years, therefore, the problem has been re-investigated by many physicians, and the tendency has been for their results rather to detract from the importance of family predisposition in juvenile rheumatism (see MEDICAL ANNUAL, 1927, 430, and 1929, 415). A very complete and satisfactory series of 400 families has been studied at Queen Mary's Hospital, Carshalton, by N. Gray Hill and M. Allan.² In the 400 families there were 2156 children, of whom 540 were rheumatic. The incidence of juvenile rheumatism in the parents and families was carefully studied, and the results were as follows:—

| | Per cent |
|-----------------------------|----------|
| Both parents | 1.50 |
| Father but not mother | 12.25 |
| Mother but not father | 16.75 |
| Neither parent | 69.50 |
| No family history | 42.75 |

The authors were fortunate in having amongst the families studied no fewer than eight examples of twins. In not a single instance did both twins develop recognizable rheumatism. They also bring out another very interesting point, namely, that in the larger families (with six children or more) in no instance were there more rheumatic than non-rheumatic children. This seems to show that when we have added together the influences of environment, family predisposition, and all the social factors, there still remains some factor concerning the individual child which is of importance. The authors conclude that there is only slight evidence that juvenile rheumatism occurs more frequently in certain families than in others.

REFERENCES.—¹*Arch. of Dis. Child.* 1930, v, 191; ²*Brit. Med. Jour.* 1930, i, 940.

KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—H. E. Shortt and his assistants have continued their investigations in Assam, and they now report¹ having found a number of typical *Leishmania donovani* parasites in the bowel mucus of kala-azar patients with dysenteric symptoms, the first time that quite typical *L. donovani* have been so found.

DIAGNOSIS.—Further investigations are reported from the Calcutta School of Tropical Medicine on the relative value of the aldehyde and the antimony tests with a view to establishing a simple and reliable blood test in the place of spleen puncture in the early diagnosis of kala-azar. Thus R. N. Chopra and N. N. De² report further on the *serum-antimony test* of the former (see MEDICAL ANNUAL, 1929, p. 250). They state that the best time for reading the result is after five to ten minutes, when a coarse flocculent precipitate should be present in a positive result; they claim 96.5 per cent of correct results with undiluted serum and 87 per cent with a 1-10 dilution, they and hold that the size of the spleen does not affect the result. L. E. Napier³ also reports further on this test, and he has found that the proportion of correct to incorrect results was 25:1 with the aldehyde test, 15:1 with diluted serum, and only 6:1 with undiluted serum. R. N. Chopra and B. P. Mukherjee⁴ describe a simple modification of the antimony test in which a drop of finger blood is received into a small test-tube containing $\frac{1}{4}$ c.c. of a 2 per cent solution of potassium oxalate and allowed to stand, in place of taking blood from a vein.

After ten minutes the supernatant fluid is transferred with a pipette to a small test-tube and a 4 per cent solution of urea-stibamine allowed to run down the side of the tube, when a coarse flocculent precipitate indicates a positive reaction within five to fifteen minutes, which is the proper time for reading the result. Correct indications were obtained in 80.7 per cent of cases against 84.7 per cent with the aldehyde test, so it is likely to prove of value as a bedside method.

L. E. Napier and G. N. Sen² have carried out further extensive tests to determine the most suitable dilutions for the antimony test; from these they conclude that the addition of 25 per cent serum to either $\frac{1}{2}$, 1, 2, or 4 per cent urea-stibamine is best, with 58 per cent correct, 7 per cent incorrect, and 35 per cent doubtful results. For clinical purposes they advise adding 2 drops of serum to 1 c.c. of 0.5 per cent urea-stibamine, as preliminary clinical trials have given satisfactory results. H. E. Shortt and others⁶ also report on 700 urea-stibamine tests, the results of which agreed with the protozoological findings in 81.3 per cent, and there were only 2.5 per cent of negative results; but of 144 positive tests the error was 45.1 per cent, so that they consider the test to be of greater value in excluding kala-azar than in revealing its presence. L. E. Napier and C. R. Das Gupta⁷ have tested the provocative action of an intravenous injection of pentavalent antimony in increasing the number of the *L. donovani* parasites in the peripheral blood, and they found a definite increase of diagnostic value in five to ten minutes.

R. B. Lloyd, L. E. Napier, and G. C. Mitra⁸ report further on the Wassermann reaction in 474 cases of kala-azar examined in Calcutta in which leishmania parasites had been demonstrated, with positive results in 22 per cent, which is no higher than the estimated syphilis rate in the controls, so they conclude that this disease is not a cause of positive Wassermann reactions. Jui-wu and Dorothy Huie⁹ have tested the Khan reaction in kala-azar cases in China, with positive results in only 3 of 37, which were accounted for by the presence of complicating syphilis, and they note that the globulin-precipitation test was strongly positive when the Khan reaction was negative; this indicates a specific difference in the globulins present in these two diseases.

E. Muir¹⁰ discusses the differential diagnosis between dermal leishmaniasis and leprosy; he records that 14 cases of the former affection have come to the Calcutta Leprosy Clinic within a year, and that both the depigmented and nodular stages may easily be mistaken for leprosy until a microscopical examination is done in the case of nodules, and the absence of anæsthesia is noted in the depigmented patches. Dermal leishmaniasis yields almost as readily as kala-azar itself to antimony treatment.

CLINICAL.—L. E. Napier and C. R. Das Gupta¹¹ record a full and well-illustrated account of post-kala-azar *dermal leishmaniasis* based on no fewer than 150 cases seen at the Calcutta School of Tropical Medicine Clinic during the last twenty-eight months. They find that cases occur after spontaneous recovery from kala-azar as well as after treatment, and that 80 per cent gave a history of a previous attack of kala-azar, while a large proportion of the dermal attacks occur one or two years after the febrile stage. The earliest lesions consist of depigmented areas following erythema, next appear soft granulomatous nodules of a yellowish-pink colour about the size of a split pea, and later a verrucose type may develop, in addition to which they describe papillomatous, hypertrophic, and xanthomatous types in cases of long duration. In the pigmented form the *L. donovani* are usually only obtained by cultural methods, but may be found as a rule by microscopical examination of the nodules in later stages. The depigmented spots were found most frequently below the shoulders, and the nodules above and most often on the

face, and in 88 per cent the lesions appeared within three years of an attack of kala-azar.

R. B. Lloyd and L. E. Napier¹² record further precipitin antisera tests to determine the origin of the blood in fed sandflies in Calcutta, and they found human blood in 88 per cent of the insects, which could be identified by this test as late as eight days after feeding. A larger percentage of *P. argentipes* contained human blood in the hot season and in the autumn, the latter being the time when most cases of kala-azar begin.

TREATMENT.—W. Roehl¹³ has tested certain antimony compounds in hamsters infected with the *L. donovani*, by weekly subcutaneous injections and puncturing the liver to look for the parasites. Tartar emetic is not suitable for subcutaneous use, antimosan had a chemotherapeutic index of 1 to 5, stibosan 1 to 5 up to 1 to 7, and neostibosan 1 to 50—that is, the curative dose was only one-fiftieth of the minimal lethal dose. Napier's clinical preference for **Neostibosan** is therefore confirmed. U. Brahmachari¹⁴ and his assistants report five kala-azar cases treated successfully by intramuscular injections of **Sodium n-Phenylglycineamide-4-stibenate**, the antimony analogue of tryparsamide; the local irritation is frequently slight. He had previously reported eight cases treated by intravenous injections of the same preparation. The same worker¹⁵ reports that, after the intravenous injection of metallic antimony in a state of fine subdivision prepared by Plimmer's method, the particles of antimony could be demonstrated in the cells in the spleens of the treated mice, including cells containing leishmania, some of which appeared to be degenerated. C. S. Keefer, O. K. Shaw, and C. S. Yang¹⁶ write on the successful treatment of the anæmia of kala-azar by **Antimony, Blood Transfusions, and Liver and Iron**. G. Caronia¹⁷ has reviewed briefly the history of the use of antimony compounds in kala-azar during the past fifteen years; he still prefers potassium or sodium antimonyl tartrate.

L. E. Napier¹⁸ deals with the treatment of post-kala-azar dermal leishmaniasis, which is very much more resistant to the antimony treatment than the visceral form of the disease. Nevertheless, an extensive experience of no fewer than 150 cases seen at the clinic of the Calcutta School of Tropical Medicine has shown that perseverance with the pentavalent antimony preparations is usually successful in time, although fewer than twenty injections often failed to cure. However, 100 per cent successes were obtained after thirty-one or more injections in the course of up to four months' treatment, and with a total of over 6 grm. of the drugs; in exceptionally obstinate cases treatment for a year may be necessary.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1929, Oct., 644; ²*Ind. Med. Gaz.* 1929, Dec., 661; ³*Ibid.* 669; ⁴*Ibid.* 1930, April, 203; ⁵*Ind. Jour. Med. Research*, 1930, April, 1139; ⁶*Ibid.* Jan., 907; ⁷*Ibid.* 749; ⁸*Ibid.* 957; ⁹*Nat. Med. Jour. China*, 1929, Aug., 436; ¹⁰*Ind. Med. Gaz.* 1930, May, 257; ¹¹*Ibid.* 249; ¹²*Ind. Jour. Med. Research*, 1930, July, 347; ¹³*Ind. Med. Gaz.* 1929, Oct., 563; ¹⁴*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, April, 617; ¹⁵*Ibid.* 623; ¹⁶*Nat. Med. Jour. China*, 1929, Dec., 731; ¹⁷*Amer. Jour. Trop. Med.* 1930, July, 261; ¹⁸*Ind. Med. Gaz.* 1930, July, 193.

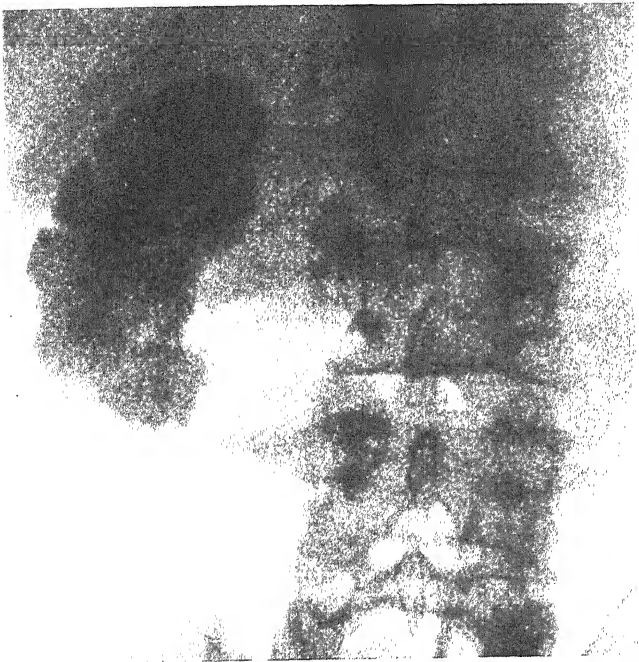
KERATITIS. (See CORNEA, DISEASES OF.)

KIDNEY, CALCIFICATION OF. Sir W. I. de C. Wheeler, F.R.C.S.I.

Calcareous deposits in connection with tuberculous kidneys are irregular and have an uneven density and lie in the kidney substance. Plate XXII shows complete calcification of one kidney in a patient of 68 who had suffered from pain and frequency of micturition for twelve years, with intermittent attacks of high temperature. It illustrates the spontaneous cure of renal tuberculosis.

PLATE XXII

CALCIFICATION OF THE KIDNEY



Calcification of the right kidney in a patient of 68 who had suffered from pain and frequency of micturition for twelve years.



Various examinations were made of the urine, no tubercle bacilli were found, and guinea-pig inoculations were followed by negative results. These examinations were probably made after calcification was complete. The ureter could be palpated through the abdominal wall.

KIDNEY DISEASE. (*See RENAL DISEASE.*)

KIDNEY, SURGICAL AFFECTIONS OF.

Sir John Thomson-Walker, F.R.C.S.

Intravenous Urography.—Following upon early attempts in 1923 at visualization of the urinary tract by means of intravenous injections of a 10 per cent solution of sodium iodide, and later by the use of a substance containing sodium iodide bound to urea, M. Swick¹ in 1929, working under Lichtwitz at the Altonaer Hospital, Berlin, and later at the St. Hedwig Hospital, Berlin, under von Lichtenberg, experimented with 'Selectan Neutral' synthesized by Binz and R  th. Intravenous injection into rabbits of this substance, which has an iodine content of 5.4 per cent, demonstrated the fact that the renal parenchyma and the urinary bladder could be visualized by subsequent radiographic methods, while the renal pelvis and the ureter, on the other hand, were poorly seen. Ligation of the ureter, however, brought the whole upper urinary tract well into view. Simultaneous observations of the excretion of this drug, which were limited to quantitative determinations of the iodine component, revealed 75 to 80 per cent of the injected iodine in the urine. Except for traces of iodine in the bile, its presence in the tissues and feces could never be detected. As regards the toxicity of the drug and the tolerance exhibited to it, the writer found that 0.2 gm. per kilo. of body weight could be administered intravenously into a rabbit without demonstrable ill effect, whereas 0.33 gm. per kilo. produced transient generalized disturbances. On the basis of these calculations, theoretically, one could give to a 60-kilo. individual 18 gm. of the substance as the maximum dose. Considerably smaller doses than this, however, were found in man to produce headache, nausea, vomiting, and in two cases transient diplopia, but a reaction never occurred that was severe enough to cause the writer to discontinue his investigations, especially as the radiographic results, though not sufficiently good for practical purposes, pointed to the possibilities of further development. The problem, then, resolved itself into devising a modification of 'selectan neutral' such as would accomplish the following requirements: (1) A diminution of the toxicity by means of the substitution of the methyl group so as to permit the administration of a larger dose and thus attain a higher concentration of the excreted iodine component—an important point for radiographic success; (2) An increase in solubility; (3) An increase in the iodine content of the molecule; and finally (4) If possible, an increase in the affinity of the drug for the kidney. At this stage the investigation was continued at St. Hedwig Hospital, Berlin, and with the above requirements in mind, Binz and R  th prepared modifications of the original substance. At first these, because of their higher iodine content, were very insoluble in water and unsuitable for intravenous injection. Later, however, by means of a reduction of the iodine content and the substitution of the methyl radical by sodium glycine, the clinically applicable substance 'Uroselectan' was finally obtained. Uroselectan is non-toxic, very soluble in water, neutral in its reaction, and under normal conditions is excreted as such through the genito-urinary tract within eight hours of its administration practically to the extent of 90 to 100 per cent, suggesting the likelihood that no chemical reaction takes place in the body. The writer states that examination of the blood for the presence of the iodine component fails to reveal it at intervals

differing from five minutes to as much as three hours after injection. Investigations of the tissues to determine the distribution of uroselectan are still in progress. The iodine in the molecule exists in a very stable organically bound state, and neither in solution nor in its excreted form is the iodine present in an inorganic ionized state. This fact, in spite of the relatively large quantity of the calculated iodine component of uroselectan that can be administered with impunity, explains, the writer thinks, why iodism has never been observed. Quantitative determinations of the excreted substance can form the basis for a functional test, and investigations in this direction are still being continued. Results already obtained suggest that a normally functioning kidney can excrete this substance in comparatively large quantities within a relatively short period. The writer terms this the normal 'thrust excretion' present during the first two hours, during which about three-fifths of the substance is excreted. About a quarter is excreted during the next two hours, and the remainder during the subsequent four hours. It is upon the ability of the normally functioning kidney to excrete three-fifths of the dose administered during the first two hours that good radiological visualization depends, since the latter is dependent upon a definite concentration of the shadow-giving element.

Correctly to estimate the value of this intravenous method of pyelography, and to interpret its results, it is very important to remember that the method is an excretory one. Mere non-visualization does not necessarily signify permanent renal functional inhibition, for the excretory activities of the kidney can be temporarily hindered. The method of administration is as follows: For an adult, from 33 to 40 grm. of uroselectan are dissolved in 100 c.c. of doubly distilled water. The solution is filtered twice through ordinary filter-paper and sterilized in an autoclave at 15 lb. pressure for half an hour. A child of 7 years receives half, and a child of 2 years a quarter, of the dose administered to an adult. The injection is best carried out with syringes in two stages at intervals of from three to five minutes. The first X-ray examination, under ordinary conditions, is made about fifteen minutes after the last injection. The second exposure is made about twenty to thirty minutes after the first, and the third a similar period after the second. The number and time of subsequent exposures depend upon the functional activity or derangement of the kidney. When the function is poor, subsequent exposures should be roughly at two- to four-hour intervals, the actual course adopted depending upon the density of the shadow present. Experience alone, however, can guide in this respect. As regards reaction, during injection transient thirst, and a feeling of generalized warmth, particularly in the face and bladder region, are felt. On two occasions slight nausea was present, and in one case shivering and vomiting of short duration occurred. The writer reports one death in a child with severely infected contracted kidneys and double dilated ureters. There were no evidences of drug intoxication. Swick considers that uroselectan is well tolerated and yields practical results, being indicated when ureteral catheterization is dangerous or mechanically impossible, or where mechanical or infective conditions of the lower genito-urinary tract prohibit instrumentation. It is also useful in patients exhibiting extreme nervousness, in urological conditions in children, in the presence of severe and persistent bleeding, for the investigation of the renal functional activity in cases of implanted ureters, and finally for investigating the dynamic activity of the kidney, ureter, and bladder. Pyeloscopy is only feasible when the density of the excreted substance is sufficient for screening; thus, when the renal function is poor, pyeloscopy results will be correspondingly deficient.

A. Roseno² reports the use of a compound of **Sodium Iodide and Urea** for intravenous injection as a means of radiographic visualization of the urinary

tract. He claims that the urea not only renders the iodide non-toxic, but gives it a selective affinity for the kidney, which excretes it rapidly and in sufficient concentration to be opaque to X rays. The compound is dissolved in 300 c.c. of saline and injected slowly into a vein. Amounts containing as much as 38 grm. of iodide have been given in this way without untoward effects. Pictures are taken fifteen minutes after the injection.

E. J. H. Roth and H. W. S. Wright³ report three cases submitted to X-ray examination of the urinary tract after injection of **Uroselectan** intravenously. To an adult they give 40 grm. of the drug dissolved in 80 c.c. of re-distilled water, and state that a solution that had been boiled for three hours was used without ill effect. For children the dose is proportionately smaller. Up to the age of 6 they inject 10 to 12 c.c. of the 40 per cent solution; from 6 to 10 years 20 to 40 c.c.; and from 10 to 15 years 50 c.c. The patient is prepared for X-ray examination in the usual way, and a preliminary radiogram is taken. The injections have not been followed by any reaction other than a slight increase in the pulse-rate and a transient rise in blood-pressure of some 12 mm. of mercury, during which time there may be a feeling of giddiness. The writers have taken serial radiograms at three-minute intervals after injection and find that, generally speaking, there is a satisfactory shadow after six minutes, and that in fifteen minutes there is a clear outline of the whole urinary tract.

F. Kidd,⁴ W. W. Galbraith and W. A. Mackey,⁵ K. Heritage and R. O. Ward,⁶ S. Lubash,⁷ N. E. Berry,⁸ A. L. Wolbarst and I. S. Hirsch,⁹ also contribute papers on the use of the intravenous injection of uroselectan as a means of showing up the urinary tract for purposes of radiological examination.

[In intravenous pyelography we have a new and valuable method of diagnosis. It would at first sight appear to relieve the surgeon of the difficulty and the patient of the discomfort of catheterization of the ureters with subsequent direct pyelography. Even at this early stage, however, it is evident that direct catheterismal pyelography will be supplemented but cannot be replaced by the intravenous method, and in a given case the surgeon must be prepared to practise one or other method which will give most information. Von Lichtenberg and Swick, to whom we owe the method, sum up the indications for intravenous pyelography as follows: (1) When for anatomical or pathological reasons ureteral catheterization cannot be carried out; (2) When there is complete obstruction of the ureter; (3) When direct pyelography cannot be carried out without risk. Further work on the relative value and indications for use of these two methods of pyelography will be welcome.—J. T.-W.] (*See also X-RAY DIAGNOSIS.*)

Congenital Deformities.—A. R. Thompson,¹⁰ as the result of the investigation of 13,000 cases of all diseases coming to post-mortem examination at Guy's Hospital, draws the following conclusions as to congenital deformities of the upper urinary tract other than those of horseshoe kidney and solitary kidney, with which he has dealt in previous papers. The whole adrenal gland of one side may be situated actually within the kidney capsule, and thus might be excised during nephrectomy. The kidneys may be very unequal in size without sign of disease, but in certain cases the smaller kidney may have been subjected to pressure, as for example by an enlarged liver. The kidneys may be quite small but healthy, and such a condition does not appear to shorten life. They may be congenitally displaced, as evidenced by their blood-supply, and such displacement is not produced by forces acting from without. The writer finds floating kidney—i.e., a kidney with a peritoneal covering—to be exceedingly rare. Fetal lobulation is of importance in connection with the question of aberrant blood-vessels, and indicates a terminal distribution of these vessels. With regard to the ureters, they may be double along part or the whole of their

course, and the condition is more common in males than in females. Double ureters are associated with double small pelves, and may lead to symptoms of renal trouble and actual disease of the kidney owing to their small size. Stenosis of the ureters may be due to disease, but also to congenital causes. An aberrant renal vessel may be very large. It is terminal, and division may lead to atrophy of the renal tissue supplied by it, and gangrene may result.

Operation on Single Kidney.—E. L. Keyes¹¹ describes operations upon the single kidney, especially on account of stone, on the basis of 6 patients whose only kidney—and in 1 it was a congenital solitary kidney—had been operated upon, in 5 instances for stone and in 1 instance for acute suppuration. In the case of acute suppuration decapsulation was performed for acute suppurative nephritis. The other 5 patients were subjected to pyelolithotomy in 1, and pyelonephrolithotomy in 4. All the patients survived and have been followed up for periods varying from thirteen months to two years. These cases are described in detail. Special precautions mentioned in operating upon the solitary kidney are, to leave a pyelotomy incision unsutured, and to decapsulate the kidney. These precautions are carried out in the hope of minimizing post-operative renal congestion and therefore producing less risk of anuria. The renal parenchyma should, of course, be spared as much as possible and the operation carried out with extreme gentleness.

T. W. Hepburn¹² reports a case of hemisection of a solitary kidney in a man of 42. He considers that partial nephrectomy of a solitary kidney, when successfully performed, leads to marked improvement in the function of the remaining portion. The operation, however, is not a good one if there is a sound kidney on the other side, because the function of the portion left gradually diminishes owing to disuse atrophy.

Supernumerary Kidney.—H. L. Kretschmer¹³ reports a case of a woman of 22 in whom was found a normal kidney on the left side and two kidneys on the right side, one of which was the seat of a very large infected hydronephrosis. There was no communication between these two kidneys on the right side, each having a separate blood-supply and a separate ureter, but the ureters fused below the brim of the pelvis outside the bladder. The two kidneys were removed. The writer reviews the literature of true supernumerary kidney, which is probably the rarest of the congenital renal anomalies, and has found that only thirty cases, including his own, have been reported up to the present.

'Infantile' Kidney.—A. G. Fleischman and B. Anderson¹⁴ report a case of 'infantile' kidney occurring in a woman of 53. Discussing the subject in general, the writers state that the so-called infantile kidney shows marked impairment as determined by colorimetric tests, but is able to excrete normal urine and concentrate urea in normal quantities. Pyclography is often of assistance in diagnosing this rare condition, but cannot always be relied upon. The decision as to operation upon a diseased kidney when the opposite kidney is infantile must be carried out with caution because of the inability of the infantile kidney to undergo compensatory hypertrophy. Infantile kidney is often designated 'congenital atrophic kidney' or 'kidney hypoplasia', but all writers agree that it is the result of an arrested development. It is, however, extremely difficult to differentiate between the small kidney which is the result of some acquired pathological process and the kidney that is atrophic because of some congenital non-development.

Nephroptosis.—E. L. Peirson, jr., and J. D. Barney¹⁵ report the results they have obtained after performing **Nephropexy** in patients with nephroptosis. They have followed up 40 cases in which a simple nephropexy and freeing of the ureter was performed. The minimum time for determining the end-result was set at six months after the operation, but the majority have been followed

up for a period of several years: 14 cases were cured, 9 improved, and in 17 the operation was a failure. This high percentage of failures was ascribed in some to the fact that, as a mobile kidney was the only positive finding on full investigation, nephropexy was performed as a last resort without sufficient reason. There was, however, in the majority of failures and partial failures one outstanding feature—namely, marked neurosis and a faulty posture often associated with general abdominal ptosis. The writers conclude by saying that a well-fitted abdominal belt generally gives relief to cases that have not been cured by the operation.

Hydronephrosis.—A. von Lichtenberg¹⁶ states that for the last twenty years he has repeatedly emphasized that the technical term 'hydronephrosis' is incorrect because it comprises various different pathological conditions which have in common merely the same morphological picture. Although the pathological changes in the kidney are fundamentally alike, yet the different pathological conditions creating them are numerous and dissimilar. He would prefer to use the term 'Harnverstopfung', which means 'urinary constipation'. This term includes all the different forms of pyelectasis. The writer is strongly of opinion that the majority of cases of distal obstruction—i.e., obstructions situated in the ureter or below—can be relieved by conservative measures without removal of the kidney. In proximal renal obstructions the circumstances are less favourable, and on account of total destruction of the kidney nephrectomy has to be performed in many cases. Of 80 cases operated upon in his clinic for renal obstruction during a period of two years, in 41 per cent he had to remove the kidney as destruction was complete. In 59 per cent conservative treatment was carried out, but a secondary nephrectomy had to be performed in 3 of these cases. Von Lichtenberg emphasizes that at operation a sufficient exposure of the kidney should be made to allow of a good view before disturbance of the parts. This, he considers, necessitates removal of the twelfth rib and occasionally also of the eleventh.

W. C. Quinby¹⁷ states that in his opinion too many nephrectomies have been performed, and are still being performed, mainly because of a lack of familiarity with the possibilities for conservation of the kidney offered by plastic operations, or lack of knowledge of their technique. Renal conditions most frequently amenable to plastic surgery are those in which stasis of urine within the renal pelvis or ureter has taken place. Stasis is a well-known cause of secondary infection or the formation of stone; but even if these two conditions do not supervene, hydronephrosis with associated renal pain is a sequel. The writer confines his remarks to those cases in which a hydronephrosis is found associated with an abnormality of the renal blood-supply—cases which are of relatively common occurrence. He advises against division of aberrant renal arteries, if of any size, for they are end-arteries and ligation of them leads to more or less necrosis of the renal parenchyma. In some cases in which the vessel is of large size its division causes a destruction of nearly half the kidney. The writer considers that hydronephrosis occurring in such cases is due, at any rate in the early stages, to partial inhibition of normal peristalsis by the arterial beat of the apposed vessel, and that removal of the ureter to another position on the pelvis, out of contact with the vessel, and re-implantation of it in this position, is the best method of relief. Quinby has followed up sixteen cases thus operated on by investigating them at various periods after operation, and has found that in all cases the function of the kidney operated upon has improved.

Heminephrectomy.—W. Walters¹⁸ reports in detail four cases of partial resection of a kidney. In three the operation was for the removal of the diseased portion of a duplicated kidney, and in one for the removal of a large solitary cyst from the lower pole of one kidney.

Ureteropyelonephrostomy.—W. Walters¹⁹ emphasizes the value of plastic operations on the renal pelvis and ureter in suitable cases of obstruction to the urinary outflow by describing two cases of ureteropyelonephrostomy. In one case the operation was one of absolute necessity in view of the fact that the obstruction at the ureteropelvic junction was complete, and the kidney was solitary. The second case illustrated the fact that such an operation could be done with success in the presence of infection of the kidney. The degree of infection of the kidneys is diminished and the renal function improved by such measures. In each case the kidney was drained by means of nephrostomy for some ten days after operation.

Essential Hæmaturia.—B. C. Wheeler²⁰ describes the pathological changes found in the renal pelvis in five cases of so-called 'essential hæmaturia'. The diagnosis of the condition has to be made entirely by a process of exclusion, and before it is justified cystoscopy must have shown blood-stained urine coming from one or both kidneys, the function tests of which are normal and pyelograms negative. Increasing accuracy of urological diagnosis has steadily diminished the incidence of such cases. However this may be, many cases of 'essential hæmaturia' have been followed up over a period of years without showing further signs of serious disease. Thus, 155 cases from the Mayo Clinic were followed up for from five to twenty years after the original diagnosis had been made, and of these in only 6 was the appearance of any definite renal disease subsequently reported. Calculi had developed in 3, and the other 3 had had nephrectomy performed elsewhere for unknown reasons. At the Johns Hopkins Hospital 30 cases were followed up for periods varying from one month to thirteen years, and although some suffered recurrence of bleeding, none gave signs of having developed obvious kidney disease. A second indication that 'essential hæmaturia' is not necessarily early evidence of serious disease is obtained from the increasing number of pathological examinations which have been made on kidneys removed at operation either because of persistent bleeding or on account of mistaken diagnosis. In many such specimens no sign of serious disease could be demonstrated. Of course the term should not be applied to bleeding due to Bright's disease or hypertension, or to its occurrence in the course of blood diseases such as purpura, hæmophilia, and leukæmia.

According to Braasch, the two most common renal lesions that cause bleeding are neoplasm and 'essential hæmaturia'. In the records of the Massachusetts General Hospital in the six years 1923-8 inclusive, when there were 42,165 admissions, Wheeler found only 12 cases in which, after thorough investigation, the diagnosis of 'essential hæmaturia' was justified. None of these cases was operated upon, but two others, diagnosed as 'idiopathic hæmaturia' after negative findings on the first admission, returned two and four years later respectively with calculi. At the Peter Bent Brigham Hospital, during the same six-year period, out of 27,387 admissions there were 14 cases of 'essential hæmaturia', in 5 of which **Nephrectomy** was performed. The pathological findings in these 5 cases are described by Wheeler in detail. In all the cases the lesions described, though varying somewhat in nature, were located very near the renal pelvis. In the lesions in question there were two essential features: (1) Hæmorrhage as the result of extravasation of red cells from dilated, thin-walled capillaries and veins into the tissues beneath the pelvic epithelium, and thence presumably through the epithelium; and (2) A chronic inflammatory reaction, in the form of a round-cell infiltration, associated in some cases with destruction and fibrosis of the pelvic fat. The increase in size and number of vessels was so marked in some cases as to suggest the designation of "angioma or capillary nævus of a renal papilla". Various

names have been given to the condition according to the relative prominence of the vascular dilatation or the chronic inflammatory appearances, e.g., 'varix papillæ', 'papillitis', 'hæmorrhagic pyelitis', and 'pyelitis nodularis'.

Acute Hæmatogenous (Metastatic) Perinephric Abscesses.—H. Brunn and G. K. Rhodes²¹ discuss this subject, and emphasize the similarity of the underlying pathology of the condition to acute hæmatogenous osteomyelitis. Both are apt to follow pyogenic skin infections, but whereas the former occurs in adults, the latter is almost invariably found in children. The reason for this is that pyogenic cocci, especially staphylococci, are in the child carried to the vascular bone-marrow, which is undergoing great metabolic activity and where the arteries in the metaphysis are end-arteries. The perinephric fat in childhood is practically absent. In adults, on the other hand, the perinephric fat is well developed, and study of the arterial supply of the renal cortex and fatty capsule shows the arteries to be typical end-arteries. The perinephric fat is rather poorly supplied by numerous small end-arteries arising as follows: (1) Certain of the intercolumnar arteries of the renal cortex penetrate the fibrous capsule and terminate in the fatty capsule; (2) There is usually a separate and distinct artery arising from the renal artery which supplies the fatty capsule; (3) Smaller inconstant branches given off from the spermatic, suprarenal, and mesenteric arteries, also end in the fatty capsule. This network of end-arteries is capable of holding up clumps of bacteria, and these, in turn, set up local foci of inflammation. The majority of such infected emboli will lodge in the renal cortex, but occasionally a primary lodgement occurs by way of the small arteries, terminating in the fatty capsule. In the former instance the result is the potential renal carbuncle or cortical abscess, while in the latter event a perinephric abscess may develop. Not uncommonly a cortical inflammatory lesion extends to the periphery, ruptures into the fatty capsule, and thus forms a secondary perinephric abscess. It is therefore often difficult to differentiate clinically between these two pathological conditions, but fortunately a similar exploratory incision is indicated in each instance. A point emphasized by the writers is the importance of radiographic examination of the lumbar region, as obliteration of the psoas shadow is a valuable diagnostic sign when such obliteration is associated with a suspicious clinical history.

Staphylococcal Infections.—J. L. Joyce²² has studied the clinical records of 61 patients afflicted with severe staphylococcal disease who have been under his care during the past ten years. Of these patients 14 had renal lesions. Furunculosis and osteomyelitis have received much attention in the literature, but less notice has been taken of the more uncommon reactions of the other tissues of the body to staphylococcal disease, among which those of the kidney are of the greatest importance. Staphylococcal abscess of the kidney is rarely, if ever, found in the pyramidal region, but because of the peculiar arrangement of the renal vessels such an abscess is almost always at or near the cortex. There is therefore no pus in the urine and the clinical signs of pyelitis are absent. During the last twenty years the view has been rapidly gaining ground that perinephric abscess in cases of staphylococcal disease is related to a blood-borne disease of the kidney cortex. The staphylococcus is the commonest organism in both primary perinephric abscesses and in focal cortical abscesses of the kidney, and a normal urine should not be regarded as excluding the possibility of a cortical renal abscess. The writer reports his 14 cases in three groups. The first one of 8 cases is made up of examples of acute staphylococcal renal infections confirmed at operation or at a post-mortem examination; the second group of 4 cases illustrates the grave sequelæ which can occur; while the third group consists of 2 examples of apparently

spontaneous recovery. As regards the first group, 7 of the 8 patients were operated on for their renal lesions; the eighth died of staphylococcal lesions elsewhere in the body, and a small abscess was discovered in the cortex of each kidney at a post-mortem examination. Of the 7 patients operated upon 3 recovered, and in the 2 who died death occurred from causes only remotely connected with their renal lesions, which, there is every reason to suppose, had healed. The right line of treatment in late cases is **Nephrectomy**, after the determination of the presence of a second and healthy kidney. If a perinephric abscess is present, this should be drained first and the nephrectomy performed later. If the case is seen sufficiently early, however, relief of tension and drainage appear to the writer to be all that is indicated, especially as no one can foretell that the other kidney will not become affected. Should persistent or recurrent pyrexia, a high leucocyte count, or a chronic sinus occur, a secondary nephrectomy should be performed.

Cortical Abscess.—C. P. Mathé²³ finds cortical abscess formation of the kidney to be of two types as the result of two distinct pathological processes. The first is the acute hæmatogenous type, secondary to staphylococcal infections elsewhere in the body, usually the skin, and the second is the subacute or chronic urogenous type associated with pyelonephritis, and secondary to lesions in the kidney itself and stasis in the urinary tract. The first type is often mistaken for influenza and for abdominal lesions such as appendicitis, salpingitis, gall-bladder disease, acute pyelonephritis, and perinephric abscess. It is to be distinguished from the second type by the relative paucity of urinary symptoms in proportion to the severity of the illness. Treatment of the hæmatogenous type, in early cases, was conservative in 24, and confined to measures such as decapsulation, and incision or excision of the abscess. Nephrectomy was employed in 9 cases for acute focal suppurative nephritis with abscesses of the cortex, in 1 case for carbuncle of the kidney, and in 2 cases where incision and drainage were performed too late. In 43 cases of the urogenous type of infection primary **Nephrectomy** was carried out.

Paranephritic Abscess.—R. Friedrich²⁴ discusses the clinical aspects and diagnosis of these abscesses. When a carbuncle of the kidney is not also present, microscopic examination of the urine is of little help in diagnosis during the first weeks of the illness. Abscess at the lower pole of the kidney leads to inflammation of the iliopsoas muscle, producing pain on flexion and extension of the thigh. Abscess at the upper pole leads to cessation of diaphragmatic breathing. A characteristic feature is the constantly high temperature in the presence of normal renal function tests. Radiography is of value in some cases. Exploratory operation is not advised as the needle may pass into the still healthy kidney.

Actinomycosis.—R. E. Cumming and R. J. Nelson²⁵ tabulate the nine recorded cases of primary renal actinomycosis and report in detail two of their own cases. Mention is also made of those cases reported in which the disease was secondary in the kidney or ureter, either by direct continuity from other sources, or by lymphatic or hæmatogenous extension. The disease should be considered as a systemic and not a local one, and the two conditions most often confused with actinomycosis of the kidney are tumour and tuberculosis. The effects of the fungus on the tissues lead to suppuration, necrosis, granulation, and connective-tissue formation, and thus there is a tendency to localization in part, although when a large area is involved a marked reaction in the surrounding parts occurs, as in cases of perinephric abscess due to renal actinomycosis which leads to a board-like infiltration of the abdominal wall and flank. In urinary-tract invasion the urine may show actinomycetes. The ureter and bladder appear to be less often involved than the kidney, from

which extension is rare. There is a definite similarity, both in the clinical picture and pathology, between actinomycosis and tuberculosis of the kidney, and the writers have found that the clinical course after operation is also similar to that following nephrectomy for tuberculosis. The important points in diagnosis are localized pain, fever, prostration, muscular rigidity, loss of weight, cachexia, and palpable tumour mass. The first four symptoms arise from an acute condition which in the writers' opinion is due to secondary infection, and in renal cases is associated with perinephric suppuration. The later symptoms suggest a chronic debilitating disease which is associated with severe secondary anaemia—an important symptom in both the personal cases reported, and one which has not been sufficiently emphasized in the past. Haematuria is not an uncommon symptom, and the disease is recognized by finding the typical granules (ray fungi) in the urine, in pus from suppurating areas, or in the tissues themselves. A correct diagnosis, however, is rarely made previous to operation. The history often establishes the possibility of actinomycosis, in that knowledge of contact with diseased animals, especially cattle, can be ascertained. The prognosis is very grave, since in involvement of the urinary tract the disease is so widespread as to be usually fatal, and when primary in the kidney the disease is well advanced before treatment is undertaken. **Nephrectomy** is the best procedure when applicable. **X-ray Treatment** and the use of **Potassium Iodide** and **Copper Sulphate** are only of accessory value after surgical drainage and removal of the affected organ. Bladder involvement has not been reported in the available literature. [The writers do not mention the use of sera in the treatment of the disease.—J. T.-W.]

Tuberculosis.—G. J. Thomas²⁶ has studied a large number of cases of renal tuberculosis, and finds that in the majority of cases the condition is bilateral. He has made 170 pyelograms during the last two years in patients who had, or were suspected of having, renal tuberculosis. He considers pyelograms to be indispensable for the diagnosis of early lesions of renal tuberculosis and of the greatest value in following the changes that may take place in the filling defects of the renal pelvis. In 56 of Thomas's cases pyelography gave the first positive localizing sign. He considers that bilateral pyelograms should always be made, and that these should be made simultaneously.

H. L. Kretschmer²⁷ reviews a series of 221 cases of renal tuberculosis. The most important point he makes is that even after very careful examination that shows one kidney to be apparently healthy, because of a clear urine that is free from pus and negative for tubercle bacilli, there always exists the possibility that one has failed to find tubercle bacilli, or again the possibility that in that particular kidney a focus of tuberculosis exists that has not communicated, or does not now communicate, with the renal pelvis and hence cannot be detected. In such cases renal function tests may not help, and the writer believes that information may be obtained from pyelography. In this type of case there is never any hurry to operate, and thus ample time could be taken for careful and, if necessary, repeated clinical investigation. In the writer's series there were 41 bilateral cases, i.e., 19.3 per cent, but these figures may be too low because of the difficulty already mentioned, and therefore represent a minimum and not a maximum incidence of bilateral disease.

Urinary Lithiasis.—A. P. Thompson²⁸ discusses this subject in a report on the cases examined during the years 1910–29 inclusive in the Genito-urinary Department at Guy's Hospital. Some 250 cases have been reviewed, the majority of which show the origination of stone formation to be in the kidney and the ureter, and he is of opinion that in the majority of these the stones had their origin in the renal pelvis. A certain number of stones may form

in the bladder and also in the prostate, but, except in very exceptional circumstances, they do not form in the ureter or in the urethra. The writer adopts the following classification for cases of urinary lithiasis: (1) The 'travelling stone', which may (a) be passed unaided, (b) be impacted as it travels down the urinary passages, or (c) remain in the bladder; (2) The 'resting stone'. Such a classification makes it obvious that a thorough examination, and especially a thorough X-ray examination, of the whole urinary tract must be undertaken in any case of suspected urinary stone.

Thompson emphasizes the point that the tip of the transverse process of the 4th lumbar vertebra may be epiphysial and show up as an isolated shadow in an X-ray film, and he records his experience of two such cases. The above classification, of course, does not preclude the formation of stone elsewhere than in the kidney. Stones may be formed in the bladder and rest there; on the other hand, they may be passed naturally or become impacted in the urethra. Thus the passage of the stone and not its topography is the point brought out by this classification. The author describes many cases in detail, and among the points emphasized are the following. The passage of crystals will produce symptoms similar to those produced by a grosser mass. Injury may be a possible cause of stone formation. Thompson has seen laminated and discrete blood-clots in the renal pelvis infiltrated with phosphates as the result of inflammation. A stone may be passed per urethram without the knowledge of the patient. In cases where stones are associated with sepsis, so frequently is the other kidney affected that the writer is of opinion that every kidney which can conceivably be conserved should be left *in situ* as far as is consistent with the well-being of the patient. Nephrectomy is one of the simplest operations that can be performed on a kidney, but it may be the very worst treatment that should be adopted. The prognosis of bilateral renal stone is very grave whether an operation is performed or not.

In a paper on the operative treatment of renal lithiasis, W. C. Quinby²⁹ states that the aim of operation should be to remove the stone and at the same time conserve as much renal tissue as is capable of function. For this reason nephrectomy, though often an easier type of operation, should be performed only as a last resort. At the operation he advises that, after all evident concretions have been removed, further search by X rays should be made in order to be sure that no particles remain to serve as the nucleus of a subsequent stone. Such particles are best removed by washing and by the use of the negative pressure tube.

Carcinoma.—E. S. Judd and J. R. Hand³⁰ have analysed 367 cases in which operation was advised for carcinoma of the kidney, and of this number 330 have been traced. The average age was 51·76 years. Hæmaturia occurred as the first symptom in 43·86 per cent, pain in 37·32 per cent, and tumour in 13·62 per cent of the cases. They were able to trace 283 patients who had been subjected to nephrectomy: 91 are living, with an average post-operative life of 60·88 months, whereas 192 are dead after an average post-operative life of 23·26 months. Forty-seven patients were subjected to exploration alone, and 45 of these are dead, having lived an average post-operative life of 18·78 months. Cases with involvement of the renal vein showed an immediate mortality not appreciably different from that observed in cases without such involvement, but the number of patients subsequently reported as having died is much higher among those with involvement of the renal vein.

Carcinoma of the renal cortex is extremely malignant, and often well advanced before producing symptoms. Alveolar carcinoma, which shows less cellular differentiation, is the most malignant form, whereas, as judged by

the clinical course, adenocarcinoma or papillary adenocarcinoma is less malignant. Better end-results are dependent upon earlier medical consultation by the patient after the onset of the initial sign or symptom. Judging by the results achieved in 106 cases in which the patients lived for from 3 to 22.5 years after operation, the writers consider that **Nephrectomy** for renal carcinoma is justifiable.

Solitary Cysts.—A. B. Hepler³¹ reports 7 cases of solitary cyst of the kidney, 4 serous and 3 hemorrhagic, and discusses their pathogenesis. He has been able to collect from the literature 249 cases, of which 212 were large serous cysts and 37 hemorrhagic. He considers that these large, usually solitary, cysts of the kidney are acquired, but that they are not a distinct entity with a common etiology, although the mechanism of their production is essentially the same. They result from various well-recognized pathological conditions of the kidney, but only when such conditions are so situated as to produce a combination of group tubular obstruction and anæmic degeneration of the parenchyma from circulatory disturbances in the same segment of the kidney. In some instances an additional factor is present in the form of repeated and prolonged hæmorrhages into the same area. This conception explains the variation in size, number, contents, nature of the cyst wall, and associated renal conditions, on the basis of variation of the direct etiological factor. The amount of group tubular obstruction and the area of nutritional disturbance depend on the size and distribution of the vessels involved. Among the clinical and pathological features of large renal cysts the following points lend support to this hypothesis: the average age incidence is 45 years, a period when vascular lesions such as arteriosclerosis, endarteritis, aneurysms, infarcts, and acquired lesions such as tumour are common; the fact that such cysts are frequently associated with lesions which might produce the conditions assumed to be necessary for their formation; and the frequent presence, in the kidney containing a so-called solitary cyst, of smaller cysts similar to the larger in every detail except size, and indistinguishable from nephritic cysts; the presence in the sac wall of groups of atrophied glomeruli and tubules indicating its origin from renal parenchyma which has undergone a compression atrophy with a connective-tissue substitution; the presence of remnants of neoplasm in the walls of many of the hemorrhagic cysts as the only indication that neoplasm was concerned in their formation; and in many cases the sudden onset of symptoms, the comparatively short clinical course, and the rapid growth of the cysts, which can easily be understood in the light of the experimental work carried out by the writer, in which enormous diverticula formed in a few days. The writer, by creating experimentally the conditions assumed to be necessary for cyst formation, has been able to reproduce a large solitary cyst in animals similar in every detail to those found in the human kidney.

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KNEE-JOINT, LOOSE BODIES IN.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Loose bodies in the knee-joint are usually found in connection with osteo-arthritis, tabes, tuberculosis, or acute arthritis from infection. When found in otherwise normal joints they have the appearance of detached portions of cartilage (Jones). Occasionally a loose body of abnormal size and of cryptic origin may be found. In one case operated on by the reviewer a fibroma was found in the left knee-joint of the conductor of a band. The development of the growth was thought to have been influenced by constant slight friction transmitted to the connective tissues of the joint by perpetual movements of the foot in keeping time. The man was 25 years of age. In such a case the patient seeks advice more owing to discomfort and stiffness than to actual pain. The knee does not lock; there may or may not be effusion, and there is no history of trauma. The loose body may be felt on one or other side of the patella. Movements of the joint are not limited, but full flexion and pressure on the swelling will cause discomfort amounting to pain. X-ray photographs show nothing abnormal. The history somewhat resembles that of cysts which sometimes arise in connection with the internal semilunar cartilage.

The loose body shown in *Plate XXIII* was removed through a longitudinal incision on the inner side of the patella, and on naked-eye examination appeared to be a lipomatous mass. It was attached by a very fine pedicle at the point marked A to the outer side of the deep surface of the ligamentum patellæ. The pedicle may have sprung from the retropatellar pad of fat or from the synovial membrane. The knee-joint was inspected and found normal in every respect. The pathological report stated that it was a fibroma, most probably a dendritic body originating from a tuft of the synovial membrane. There was no evidence of cartilage or bone in the section.

KNEE-JOINT, TUBERCULOSIS OF. (See TUBERCULOSIS, SURGICAL.)**LABOUR AND ITS COMPLICATIONS.**

Beckwith Whitehouse, M.S., F.R.C.S.

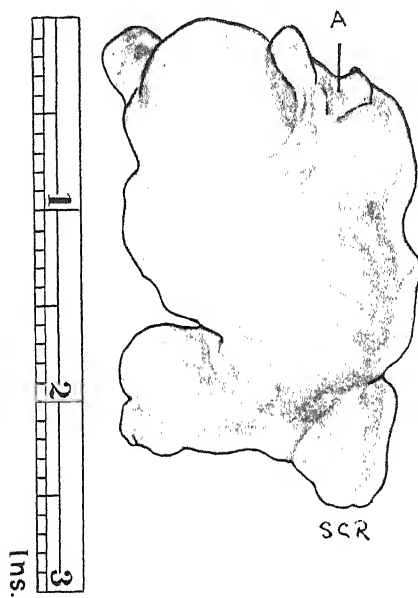
Placenta Prævia.—The danger of temporizing in cases of placenta prævia is again emphasized by Bethel Solomons and F. H. Lacey.¹ If such a practice is to be adopted, it is only legitimate when the patient is in such surroundings—preferably institutional—where immediate action can be taken in case of serious hæmorrhage. Generally the uterus should be emptied at once by the best means possible at the time.

In a series of 562 cases of placenta prævia treated at St. Mary's Hospital, Manchester, **Version** was the most common form of treatment. Either external or internal version was performed 273 times with a maternal mortality of 7.6 per cent. Version has the advantage that it can be carried out with only moderate obstetrical knowledge and skill, but on the other hand the fetal mortality is appalling. In the Manchester statistics version was associated with a fetal mortality of 81 per cent. This figure is in accord with statistics from other sources, and emphasizes only too clearly the danger to the child. Although version is comparatively a safe procedure for the mother, it should carefully be noted that version combined with immediate extraction is a very risky procedure and under ordinary circumstances is not justifiable. Lacey found that the operation was associated with a maternal mortality of 17.6 per cent—a very high figure indeed.

It is interesting to note that in Manchester the use of **Willet's Cranial Forceps** has justified itself. In 11 cases in which the instrument was fixed

PLATE XXIII

LOOSE BODY (FIBROMA) IN KNEE-JOINT



to the foetal scalp, and a small weight attached, there was no maternal mortality, and the still-births reached the lower figure of 27 per cent.

Cæsarean Section also is justifiable when the placenta is central and the foetus alive and near full-term. In Lacey's figures the Cæsarean operation was performed 33 times, with a maternal mortality of 6 per cent and a foetal mortality of 13 per cent, the lowest in the whole series.

The maternal risk in placenta prævia is of course constituted by hæmorrhage and sepsis. Bethel Solomons attempts to combat this by the immediate submammary injection of **Saline Solution** before any operative procedure is attempted. In the last fifty-five cases treated by him at the Rotunda Hospital in which saline was administered as a precautionary measure there were no maternal deaths. When placenta prævia is suspected, Solomons also is of opinion that no vaginal examination should be attempted until arrangements have been made to do whatever is necessary. Hæmorrhage may be serious and call for immediate action to control it. The presence of a prævia placenta can frequently be recognized from abdominal examination only. It should be suspected whenever fresh hæmorrhage, with the passage of clots without pain, occurs after the twenty-eighth week of pregnancy. If the fundus uteri is soft and not tender, the presenting part high, and a definite uterine soufflé present, the probability is still greater.

Occipito-posterior Presentations.—All who engage in midwifery practice will acknowledge the frequency with which the occipito-posterior case causes difficulty in labour. This is reflected in the large contribution which this type of case makes to what Douglas Miller very appropriately calls the 'casualty work' of maternity hospitals. One-sixth of the total number of emergency admissions to the Edinburgh Royal Maternity Hospital over a period of three years was contributed by occipito-posterior malpresentations. Amongst unsuccessful forceps cases the cause of failure in about one-third of the whole is again an occipito-posterior position.

The diagnosis and management of this troublesome malposition has recently been considered by Miller² in a paper which may with advantage be read and kept for reference by those who any day are likely to be faced with it. From the large amount of material which enters maternity hospitals it is evident that the emergency occipito-posterior cases fall into one of two classes. In the first, diagnosis has been at fault, and difficulty in delivery has wrongly been attributed to disproportion relating either to a contracted pelvis or a large head. The second group includes those cases wherein the diagnosis has been correct but the malposition has proved a serious obstacle to delivery. The former class appears far to outweigh the latter when actual figures are taken into account.

DIAGNOSIS.—In the absence of abnormal obesity or rigidity of the abdominal wall or excessive liquor amnii, the diagnosis of an occipito-posterior position should not be a difficult proposition. The normal uniform anterior convexity produced by the back is absent, and replaced by a flattened or irregular contour. The foetal limbs, and indeed movements, can frequently be appreciated over a wide area and often on both sides of the mid-line. The head is usually not engaged, freely movable above the brim, and deflexed. This deflexion produces a well-defined prominence or boss which is easily palpable when the palm of the examining hand is placed immediately above the poles. Auscultation is *not* reliable, since, although the foetal heart may be heard posteriorly in one flank, when deflexion is pronounced it may also be noted in the opposite lower quadrant of the abdomen. It is incorrect, therefore, because the foetal heart is heard below and to the left of the umbilicus to argue that an occipito-posterior presentation is non-existent. The position may be a right occipito-posterior with extension of the head and trunk.

With regard to diagnosis per vaginam, Miller rightly draws attention to the fact that in difficult cases the vault of the skull is so obscured by caput formation that the differentiation of fontanelles and sutures may be impossible. To identify the frontal suture, he advises that two fingers be placed one on each frontal bone. In the case of the frontal suture, the two bones can be easily moved each on the other; such mobility is impossible at any other suture line owing to moulding. As the frontal suture can only be palpated if the position is posterior, it follows that if bones can be moved on either side of a suture that is under palpation, that suture must be the frontal and one is faced with an occipito-posterior presentation.

If any doubt still exists, a general anæsthetic should be given, and as much of the hand introduced as is necessary to palpate the ear. The writer regards this as the diagnostic measure upon which most reliance is to be placed, and it should always be adopted before the application of forceps. When forceps have been applied in the absence of a correct diagnosis of position, suspicion of an occipito-posterior position should always arise if the blades tend to slip, if there is difficulty in approximating the handles, if undue force is required to move the head, or if the handles or lower parts of the blades show a tendency to stretch the perineum rather than the advancing head.

TREATMENT.—With regard to treatment, Miller is a very strong advocate of rotation of the head and trunk by **Buist's Abdominal Pads** before the head is engaged. The Edinburgh Maternity Hospital statistics prove that in 80 per cent of cases an occipito-posterior can be converted into an anterior position by this means. If the head is engaged, this treatment is not successful, but engagement usually means that the head is partly flexed and therefore spontaneous natural rotation is likely to take place during labour. In a primipara, non-engagement of the head during the last week should always suggest a probable posterior position with extension of the head and the possibility of early rupture of the membranes, slow dilatation of the cervix, and possibly an unreduced position at the end of a long tedious labour. This is just the type of case where Buist's method is so valuable by converting what may easily be a tragedy into a normal straightforward event. Whilst the pads are in position, the patient should lie in the semi-prone position on the side opposite to that occupied by the back of the child.

Should labour commence, the ultimate result is entirely dependent upon the degree of flexion present. In a favourable case—and fortunately in the majority of cases flexion of the head is satisfactory—rotation occurs when the occiput strikes the pelvic floor. This may be aided by instructing the patient to lie on the *same* side as that occupied by the back. [Posture therefore differs materially according to whether the head is free above the brim, or engaged in labour.—B. W.] Miller does not favour pressing up the sinciput to promote flexion, as it involves long manipulation and therefore may introduce sepsis. Dilatation of the cervix and rotation of the head necessarily involve a longer duration of both first and second stages. More patience is required, therefore, and at the same time a careful watch must be kept for signs of maternal or of foetal distress. Arrest in delivery may take place either at the pelvic brim or on the pelvic floor. At the brim it is not uncommon when the head is deflexed, and when it occurs the treatment is **Manual Rotation**, and manual rotation alone. No attempt should be made to complete the delivery with forceps, in spite of the great temptation to do so, with the patient deeply anæsthetized. When the head is above or at the brim, the cervix is generally not completely dilated and forceps are difficult to apply—in other words, a forceps operation at this stage is a dangerous and risky undertaking. After the head and body have been satisfactorily rotated

no further immediate treatment is indicated, and subsequent progress is as a rule generally quite satisfactory.

When the head is arrested on the pelvic floor it implies posterior rotation of the occiput into the hollow of the sacrum. This should be corrected by manual rotation as soon as the serious complication is recognized. The patient is best placed in the lithotomy position and that hand introduced which can most conveniently and easily grasp and rotate the head—that is, the left hand in a right occipito-posterior position, and vice versa. The head is first dislodged slightly upwards and then flexed. Finally both head and trunk are rotated bimanually. If the head shows a tendency to rotate backwards, it is sometimes a useful procedure to introduce the right blade of the forceps first instead of the left, as usual.

If the head is so firmly impacted that manual rotation fails, it must be delivered either with face to pubes, or an attempt to rotate by means of forceps may be made. Miller observes that rotation by forceps demands a high degree of manipulative skill, and that in less skilled hands a deliberate posterior delivery is probably attended by less risk of serious injury to the maternal soft parts and to the child. Probably most obstetricians will agree with Miller's view. If, however, rotation is effected by forceps, the blades must of course be removed and re-applied before delivery is completed.

The type of occipito-posterior case where difficulty owing to deflexion of the head may be feared is shown by Miller's figures to be that in which the membranes rupture prematurely, where delay in engagement of the head is present, or where the foetal heart is heard not only in the flank but in the opposite lower quadrant of the abdomen anteriorly. When two or more of these physical signs are present, difficulty is to be expected from a persistent posterior position in at least 80 per cent of cases. When, however, the head engages normally and the membranes remain intact until nearly the end of the first stage of labour, conservatism may confidently be practised, as rotation naturally takes place in rather more than 90 per cent of cases.

Pituitary Extract and Labour.—By many obstetricians pituitary extract is regarded as a valuable adjunct in shortening the second stage of labour, and some practitioners appear to employ it almost as a routine when delay of the head upon the perineum occurs. That the practice is not without its dangers is emphasized by A. M. Mendenhall,³ who sounds a timely note of warning and advocates the use of pituitary only under certain accepted conditions. Although considerable knowledge has recently been obtained upon the pressor action of pituitary extract and its effect upon uterine muscle, the fact remains that in actual clinical practice the effects of the same dose and of the same preparation often differ widely in patients under similar conditions. The action commonly commences within four minutes of the time of hypodermic injection, and may continue for from twenty to thirty minutes. Furthermore, once started, the effect must continue, as no satisfactory antidote to pituitary extract is at present known. In the case of the child, the injudicious use of pituitary extract has been responsible for death from intracranial hæmorrhage or asphyxia. In the mother, premature separation of the placenta, serious tears of the cervix and perineum, post-partum hæmorrhage, and even rupture of the uterus have all occurred—a rather formidable list to be associated with the use of a preparation which is by many regarded as a safe and useful adjuvant to labour.

To guard against the possibility of any unfavourable effects, Mendenhall concludes that pituitary extract is never safe during the first stage of labour. It is rarely, if ever, safe in the second stage, its use being of value “chiefly to the accoucheur instead of the mother or the baby!” Pituitary extract is

a valuable drug for the control of post-partum hæmorrhage due to an atonic uterus, and it is probably quite safe to give it during the third stage of labour. If used cautiously and in properly chosen cases, it can also probably be safely employed in the induction of labour.

Intracranial Birth Injuries.—Trauma to the foetal head during its passage through the birth canal has recently received further attention both in America and Germany. Attention is called by H. Ehrenfest¹ to the fact that many clinically normal new-born children exhibit varying transient manifestations of slight intracranial injury. A mild degree of concussion of the brain may in some instances be almost regarded as physiological. The more severe injuries cause immediate death or serious late sequelæ if resorption of intracranial hæmorrhage is not complete.

Two phases of labour are regarded by Ehrenfest as being associated with danger to the child. The first is moulding, which, by compressing the skull in one direction and elongating it in another, strains and sometimes tears the folds of the dura, thus distorting or lacerating the venous sinuses. The second is the actual passage of the head through the birth canal. A suction effect may be produced by the lowered pressure on the presenting part after full dilatation of the cervix, as compared with increased pressure in other parts of the foetal skull. This is associated with an alteration in the intracranial blood distribution. In the case of premature infants, increased friability of the vessel walls and brain membranes, and delayed blood coagulation time, introduce additional factors which favour gross trauma and account in some measure for the higher immediate mortality in children born before term.

The importance of post-natal clinical manifestations of brain trauma in relationship to birth trauma is stressed by P. L. Schroeder,⁵ who found 146 cases of infantile cerebral palsy amongst 5000 children at the Illinois Institute for Juvenile Research. Muteness, epilepsy, and faecal incontinence were comparatively common. In a second group of 79 children without palsy but who had shown evidence of cerebral injury at birth, only 5 per cent were free from what the author calls 'behaviour difficulties'. Personal traits such as cerebral distractibility and hyperactivity are apparently the result of mental retardation.

The prevention of such tragedies lies, largely but not entirely, with the obstetrician, inasmuch as natural forces alone are sufficient in certain cases to produce very serious trauma, especially with an unyielding birth canal. Some prophylactic measures are obvious. If the child is premature, a labour which is progressing normally should never be hastened. The application of forceps under such circumstances is, indeed, highly dangerous. If the birth canal, and especially the perineum, is very hard and rigid, an **Episiotomy** is frequently of value. Should it ever be necessary to extract with forceps, the blades should be applied in such a manner that intracranial tension is not increased, and undue haste in delivery is always to be avoided. This is especially important in delivery of the after-coming head in breech presentations. Ehrenfest notes that, inasmuch as 70 to 80 per cent of children who are still-born or who die soon after birth from apparent asphyxiation are really the subjects of intracranial trauma, vigorous measures for resuscitation—e.g., Schultze's method of artificial respiration—must be avoided. He further advocates the subcutaneous administration of 20 c.c. of the father's or mother's **Blood** to increase the coagulability of the foetal blood, in cases where there is evidence that intracranial bleeding is still in progress.

In Germany since the War there has been an increase in infant mortality during and after delivery. This was ascribed at first to defective care on the part of midwives during pregnancy, labour, and the puerperium. O. Fahlbusch,⁶ however, attributes it to constitutional inferiority acquired during

the age of puberty. The majority of the present-day mothers attained puberty during the War and the immediate post-war period, when hygienic conditions were very poor, especially in the great industrial centres. The more unfavourable the economic status of the mothers, the higher is found to be the incidence of still-births and infant mortality. Prematurity accounts for 30 per cent of 155 infants which died during the first five days of life at the Midwife Institute in Celle. The remaining 70 per cent were lost as the result of trauma sustained before or during delivery.

In the Rhine district the frequency of still-births has risen from 2.6 per cent in 1910 to 3.3 per cent in 1925. In the case of unmarried mothers, who, according to Fahlbusch, are usually delivered in institutions, the incidence of still-births has increased from 4.4 to 5.6 per cent, and the neonatal deaths from 3.2 to 4.7 per cent. These figures may be accounted for in part by the conduct of labour, e.g., too frequent operative interference, and the too frequent use of cecolics and sedatives.

REFERENCES. ¹*Brit. Med. Jour.* 1929, ii, 525, 527; ²*Ibid.* 1930, i, 1036; ³*Jour. Amer. Med. Assoc.* 1929, April 20, 1341; ⁴*Ibid.* Jan. 12, 97; ⁵*Ibid.* 100; ⁶*Zentralbl. f. Gynäk.* 1928, July 7, 1701.

LARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Functional Aphonia.—As a result of her experience in the orthophonic department of King's College Hospital, Miss E. L. MacLeod¹ gives the following classification of cases of loss of voice. There are two main groups, true aphonia and hyperaphonia. In *true aphonia* there is no approximation of the cords on attempted phonation. In most cases the cords move normally on coughing, and the majority of cases are met with in females. True aphonia may be subdivided into the hysterical; those due to a mechanical interference with the movement of the cords, such as an acute laryngitis or papilloma on the cords; and those due to muscular weakness associated with exhausting illnesses. *Hyperaphonia* is a condition in which both true and false cords are brought forcibly together, making phonation almost, if not entirely, impossible. Such a voice as is present is high-pitched and hard or very hoarse. The condition may be due to an hysterical overaction, may result from neighbouring inflammation, may follow a surgical operation on the larynx, or may result from abuse of the voice. Patients in this group are usually teachers, orators, auctioneers, etc. The treatment found most successful for true aphonia is the use of the **Faradic Current** by means of the synchronized stimulator, accompanied by **Suggestion** and persuasion. The particular apparatus employed has the advantage of being painless, which cannot be said for the sudden electrical shock method of employing faradism, while the results obtained are stated to be as good or even better. Cases of hyperaphonia are best treated by vocal and muscular **Exercises**, designed to relax the existing tension and induce gentle phonation.

Tuberculosis of the Larynx.—Puncture with the **Galvanocautery** seems to be becoming firmly established as the most useful local adjunct to the general treatment of the disease. D. Tovolgi,² in a long article on tuberculosis of the larynx, makes a useful suggestion as a guide in the use of the cautery. If in any given case one is doubtful as to its applicability, a single puncture is made, and this is afterwards kept under observation for a few days. A good inflammatory reaction round the puncture favours the use of the cautery. The absence of reaction or occurrence of necrosis contra-indicates it. He advances arguments in favour of the view that infection of the larynx is occasioned by contact with the sputum as against the blood-infection theory. The great preponderance of infection in the interarytenoid region is explained

by its irregularities in which the sputum is arrested. He has noted that there is an inverse relationship between the amount of coughing and infection of the larynx, and suggests that an active cough prevents sputum infection of the larynx. He therefore regards drugs such as heroin, which diminish the cough reflex, as being generally contra-indicated.

Papilloma of the Larynx.—A very full article on this subject has been contributed by H. Dahmann.³ He points out that papillomata not only spread outwards, but also occasionally into the underlying tissue apart from malignant changes. He also emphasizes the importance of making all sections for histological examination in a plane vertical to the surface (*see below*), and agrees with Horne that the lack of observation of this detail in technique not infrequently leads to a mistaken diagnosis of malignancy. Malignant transformation, however, does undoubtedly occur. In regard to treatment, he is very much opposed to X-ray therapy, in view of the many reports of severe damage to the larynx. For the same reason also, radium is considered unsuitable, and, as a result of careful consideration of all the possible means, he favours **Direct Removal** even if it has to be repeated on many occasions. In contrast with this view, V. Tempea and Gilbuoianu⁴ are strongly in favour of **X-ray Therapy**. In adults they advise a preliminary removal of the growth with subsequent radiation, while in children they consider that radiation should replace surgical removal. [In deciding between these two opposed views, I believe that the swing of the pendulum is away from and not towards the employment of X rays or radium in the treatment of laryngeal papilloma. —A. J. M. W.]

Carcinoma of the Larynx.—

DIAGNOSIS.—As a result of many years' experience, at a meeting of the Royal Society of Medicine J. Horne⁵ gave a general review of the errors in diagnosis of laryngeal cancer that may occur. He pointed out that the majority of operators had at one time or another operated on a tuberculous larynx under the mistaken diagnosis of malignant disease. He considered that whenever possible a fragment of the growth should be removed for histological examination before proceeding to operation, and suggested that in cases in which enlargement of the glands in the neck existed, removal and examination of one of these might establish the diagnosis. In regard to syphilitic lesions, he considered that these not infrequently coexisted with cancer in the larynx, and that the result of a Wassermann reaction must therefore be accepted with caution, but the result of a preliminary course of treatment with **Iodides** should establish the diagnosis. The most difficult problem is to decide whether a neoplasm, if present, is innocent or malignant. In the case of papillomatous outgrowths, he thought that many such were called malignant when in reality they were innocent, and emphasized the difficulty in such cases in stating from a microscopical examination whether the growth is certainly malignant. Even if such neoplasms are regarded as malignant, he stated that the clinical course was innocent, such cases showing approximately 100 per cent of permanent cures after removal of the affected cord. In the case of infiltrating growths the malignancy is undoubted, and permanent cures after removal of the cord are probably less than 50 per cent. He emphasized the importance of cutting sections at right angles to the surface, oblique or transverse ones frequently giving a false impression of downward growth of the epithelium (*see above*).

The question as to the malignant transformation of a papillomatous growth of the vocal cord has also been considered by C. E. Benjamins.⁶ He illustrates a tumour of the vocal cord which had been removed by the direct method, and which on section showed all the epithelial changes that are described as

occurring in the production of tar carcinoma in animals. He concludes that apparently innocent growths, particularly in adults, should be regarded with suspicion, and that when hyperkeratosis, characterized by a snow-white surface, takes place, a condition of pre-cancer exists and the growth should be removed.

TREATMENT.—

Operative Methods.—It has been pointed out by L. Colledge⁷ that the results obtained by the operative removal of carcinoma of the larynx, whether by **Thyroidectomy** or by **Laryngectomy**, have very much improved owing to improvement in technique. The greater success in the case of laryngectomy has been brought about by the more careful selection of cases and by adopting a technique in which the pharynx and trachea are shut off from one another from the commencement, thus avoiding inhalation pneumonia. He gives the following table defining what operation, in his opinion, is suitable for growths of particular situations in the larynx:—

Intrinsic Cancer:—

| | |
|---|----------------------|
| Limited to cord | Laryngofissure |
| Cord free at each extremity and mobile, or with slight loss of mobility .. | Laryngofissure |
| Fixed cord | Laryngectomy |
| Subglottic cancer | Laryngectomy |
| Invasion of anterior commissure with back of larynx free | Partial laryngectomy |

Extrinsic Cancer:—

| | |
|--------------------------------------|--|
| Epithelioma of epiglottis | Lateral pharyngotomy* |
| Epithelioma of aryepiglottic fold .. | Lateral pharyngotomy |
| Post-crioid carcinoma | Lateral pharyngotomy with replacement by skin-flap and plastic operation later |
| Pyriform fossa | Pharyngo-laryngectomy |

*Subhyoid pharyngotomy in early cases (Gluck and Soerensen).

J. E. MacKenty,⁸ in a consideration of the complications following laryngectomy and how they may be minimized, makes the following suggestions: Cases sometimes occur in which bronchial obstruction takes place and relief can be obtained by aspirating inspissated secretion through the bronchoscope. In the very old, uræmia is a risk and precautions should be taken to guard against it. Diabetes not uncommonly coexists with cancer. With the help of **Insulin** such cases can now be operated on, although the operation is usually attended by delayed healing and wound infection. He has found the previous indiscriminate use of radiation one of the greatest difficulties to be surmounted. The tissues refuse to heal and patches of gangrene may occur. He has found pneumonia to be decidedly uncommon, due, he believes, to the early separation of pharynx and trachea. In a further article⁹ he points out that, if confined to intrinsic cases, total laryngectomy has a mortality of only about 3 per cent in a series of 230 cases. The incidence of recurrence after operations was 3 per cent after laryngectomy and 35 per cent after thyroidectomy. In cases of extrinsic carcinoma recurrence is practically inevitable. He considers that if diagnosis is early, and complete extirpation of the tumour is carried out and the use of radium abandoned, the prognosis is good in cases of laryngeal carcinoma.

Treatment by Radium.—The use of radium in the treatment of laryngeal carcinoma as employed by N. S. Finzi and D. Harmer¹⁰ was dealt with in the MEDICAL ANNUAL, 1930 (p. 308). They now record the results in 29 cases, 25 of which had the diagnosis confirmed by microscopical section. They did not find that the grading of the tumours was a help in deciding the degree of radiosensitivity—in fact, most laryngeal growths seem to be sensitive whatever

their grade. They emphasize the necessity for avoiding overdosage, with its risk of necrosis to cartilage. Of the 29 cases, 14 are classified as being advanced, and of these only one has remained free from disease for more than five years. In the majority, however, temporary improvement took place. Of the 15 early cases, 11 are living for periods up to four years, and in only 2 is there any suspicion of recurrence. Four of these have died. In some of the successful cases the vocal cord returns to the normal. They conclude that radium is to be preferred to operation in all cases, since it seems to give as high a percentage of cures as surgery in the early ones with a better functional result, and in advanced ones laryngectomy can still be performed if radium fails (*cf. above*). The local reaction in the tissues of the larynx, with disappearance of the growth, is illustrated in *Plate XXIV*, drawn from a case of his own by H. Kisch.¹¹

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1930, April, 783; ²*Zeits. f. Laryngol.* 1929, April, 126; ³*Ibid.* Oct., 383; ⁴*Ann. des Mal. de l'Oreille*, 1928, Dec., 1112; ⁵*Proc. Roy. Soc. Med.* 1929, Oct., 1547; ⁶*Rev. de Laryngol.* 1929, Oct. 31; ⁷*Practitioner*, 1930, Jan., 32; ⁸*Laryngoscope*, 1929, Oct., 676; ⁹*Arch. of Otolaryngol.* 1929, No. ix, 237; ¹⁰*Practitioner*, 1930, Jan., 16; ¹¹*Proc. Roy. Soc. Med.* 1930, Feb., 375.

LEGAL DECISIONS, RECENT (on Medico-legal or Public Health Questions).

G. E. Oates, M.D., M.R.C.P., D.P.H.

Diphtheria Attributed to Post-scarlatinal Otorrhœa.—An action was brought against the medical superintendent of a fever hospital for alleged professional negligence.¹ A child was admitted to the hospital with scarlet fever and suffered from a secondary attack as well, followed by persistent otorrhœa. After the patient's discharge from hospital other members of the family became ill with diphtheria, and one of them died. After a prolonged investigation the Court found that professional negligence had not been proved. It was established that the ear discharge from the child after its return home contained diphtheria bacilli, and the case appeared to turn on whether these organisms could be the causal agent of the attacks of clinical diphtheria which occurred in the sequence of events. There was no evidence that the discharged patient ever suffered from clinical diphtheria, and the organisms when tested biologically on guinea-pigs proved to be non-virulent. The Court drew the inference, under expert advice, that such non-virulent organisms could not cause an attack of clinical diphtheria in another person.

Modern opinion tends to regard the diphtheria bacillus as normally leading a saprophytic existence on the mucous membranes of human beings, and being non-virulent or without pathogenic powers. It may under certain circumstances become virulent or pathogenic, and is then able to infect an individual who is non-immune to infection.

Dangerous Drugs.—Following the investigations of the Metropolitan Police into a case of criminal traffic in dangerous drugs, two London doctors were found to have disposed of dangerous drugs in an irregular manner without keeping a proper register. They were prosecuted and heavily fined in each case. One doctor pleaded complete ignorance of the Regulations, the other stated that overwork and ill health had caused him to be forgetful.

A Manchester practitioner was fined ten guineas including costs for failing to keep a proper register of dangerous drugs. He was acting as *locum tenens* and ordered tincture of opium and liquid morphine hydrochloride from a local chemist, but made no entry of these purchases. It appeared that the defendant had a small handbook containing particulars of the purchases, and if such particulars had been entered in a proper register the case would have been met.

The Signing of Certificates.—T. B. Layton,² who is chairman of the London Insurance Committee, draws the attention of the medical profession to

PLATE XXIV
EPITHELIOMA OF THE VOCAL CORD
 (HAROLD KISCH)

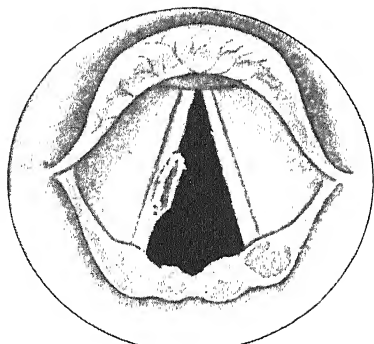


Fig. A.—Epithelioma of the vocal cord, before insertion of radium. Cord partially fixed.

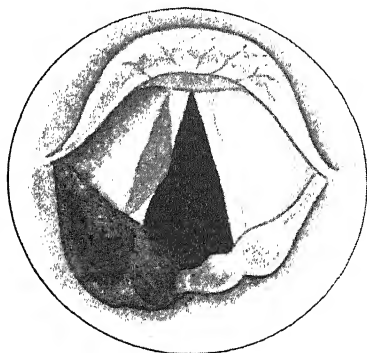


Fig. B.—Thirty-six hours after insertion of radium. Cord immobile.

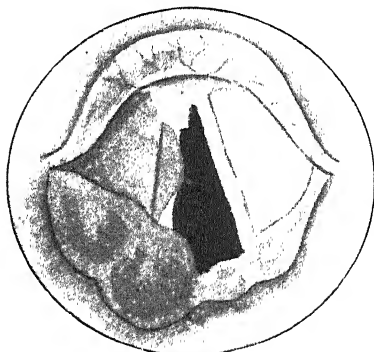


Fig. C.—After three days. Cord immobile.

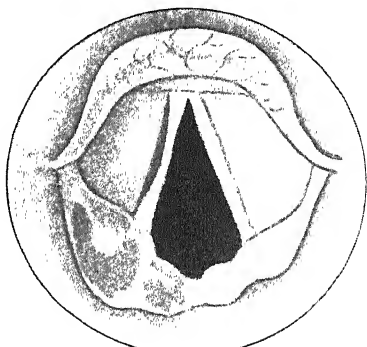


Fig. D.—Just before removal of radium. Cord immobile.

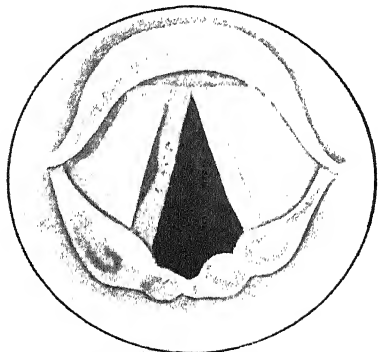


Fig. E.—Four days after removal of radium. Cord quite immobile.

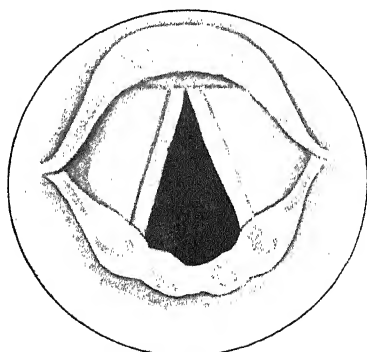


Fig. F.—Three months after treatment.

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 'Proceedings of the Royal Society of Medicine'*

the need for meticulous care in signing certificates, especially those issued under the National Insurance Acts and Regulations. Such certificates usually involve a statement of fact and a medical opinion. The statement of fact which is included in the certificate is one that the patient has been examined on the date indicated. Occasionally doctors are asked to sign such a statement in order to oblige a patient who is unable to attend or is staying away from his home. Cases are quoted in which doctors who have signed such irregular certificates have been exposed to the humiliation of an official inquiry. It is indeed possible for a doctor to become under such circumstances a party to a fraudulent claim supported by a certificate signed by him. Another class of document is that of passports, the need for which is often forgotten until the last moment, when the family doctor is asked to furnish his signature. A London doctor was recently prosecuted for having unlawfully made untrue statements for the purpose of procuring a passport. On the personal assurance of a patient of his he signed a statement that two men had been known to him for two years and were fit and proper persons to receive passports. This thoughtless act done out of kindness of heart had consequences which might have been most serious for the doctor, if the magistrate had not come to the conclusion that he had acted quite innocently in the matter.

REFERENCES.—¹*Brit. Med. Jour.* 1930, i, 93; ²*Lancet*, 1930, i, 1200.

LEISHMANIASIS. (*See KALA-AZAR.*)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The *infectiousness* of leprosy is dealt with by E. Muir,¹ who is in agreement with the general view that the disease is spread by infection to the healthy by direct contagion, especially to highly susceptible children. The danger of infection is determined by closeness and length of contact, the infectiousness of the case of leprosy, and the resisting power of those exposed to infection, which may be lowered by debilitating diseases. In early nerve cases classed as A1 he estimates the chances of infection as not a billion to one, so the danger is absolutely negligible. Prophylaxis should take these facts into consideration, and clinically positive, but bacteriologically negative, cases should be allowed to continue at work and be treated as out-patients; those slightly positive should be given six months' leave for treatment, which should render them negative and safe; and only those with large numbers of acid-fast bacilli in their skin lesions should have two years' treatment. The present indiscriminating ostracism of all lepers has a harmful effect by causing cases to be hidden without treatment and to become the most dangerous of all infection carriers. R. Hopkins, O. E. Denney, and F. A. Johansen² have recorded with illustrations a valuable clinical study, in 302 lepers at Carville, of the anatomic areas showing relative immunity to skin leprosy; these include the parts less exposed to irritation by sunlight, heat, cold, pressure, friction, and other causes of hyperæmia, such as the back of the ears, the orbital side of the nose, the axilla, the inframammary fold in women, the interdigital surfaces, and the perineum.

PROPHYLAXIS.—G. W. Bray³ records an important trial at Nauru Island, Pacific, of the modern method of prophylaxis advised by L. Rogers by means of isolating only the bacteriologically positive cases and treating the uninfected ones as out-patients—combined with the all-important frequent examination of all the healthy persons for the earliest signs of the disease. Leprosy had been introduced some years ago by a Chinaman, and after a serious and fatal influenza epidemic about 100 cases of leprosy developed, doubtless owing to the depressing effect of the influenza on persons in the incubation stage of

leprosy. The outbreak reached its maximum in 1925 with 365 cases, or 30 per cent of the population, nearly half of whom were uninfected ones; but treatment has proved so successful that three years later the total had fallen to 218, or a 40 per cent reduction, mainly owing to the release on parole as recovered of 130 cases in five years. Still more significant is the fact that no early case while under treatment had gone on to the highly infective nodular stage, so that the epidemic is likely to be practically eliminated within a decade or so. The healthy persons were examined for the early stage every month.

TREATMENT.—**Ethyl Esters** of a new oil from the Fiji 'dilo' tree, or *Calophyllum bigator*, prepared by Muir's cold process, have been tried in leprosy cases by M. E. A. Neff,⁴ who found them to have a special value, in doses of from $\frac{1}{2}$ to 5 c.c. intramuscularly, in relieving the pains of leprosy, and he records seven illustrative cases. The injections are not particularly painful, and dilo oil has been long used by Fijians as an embrocation for aches and pains of the joints and extremities. The new remedy is not as efficacious in leprosy as preparations from *Hydnocarpus wightiana*, but the two treatments can be combined with advantage in cases with nerve pains. O. E. Denney, R. Hopkins, and F. A. Johansen⁵ record an analysis of 65 recoveries from leprosy at Carville in the last ten years, but they find it impossible to evaluate the various medicinal treatments used because of the numerous factors involved, including the stage and duration on admission, etc. In the thirty-five years prior to the last decade paroles were made without repeated bacteriological examinations and 31 per cent relapsed, but with repeated examinations during the last decade the relapses have been only 3 per cent—an excellent record. Crude **Chaulmoogra Oil** orally or intramuscularly has been most continuously taken by the largest number of the paroled patients. R. G. Cochrane⁶ confirms the value of **Ephedrine** in relieving the pains and reactions of leprosy, and records seven cases illustrating its action. The drug is given orally or subcutaneously in 4 c.c. saline in $\frac{1}{2}$ -gr. doses, which may be repeated if rapid relief is not obtained. L. Rogers⁷ in his Cameron Prize Lecture before the University of Edinburgh has summarized the advances in leprosy treatment during the last decade or so, and lays stress on the necessity for relaxing rigid compulsion to enable the early easily curable cases to be attracted for treatment instead of being hidden, if more harm than good is not to be done by compulsory segregation at the present day. Eighty-eight references are given.

In the treatment of *leprosy ulcers* M. C. Lang⁸ found that **Iodoform** was very popular with his patients, but wasteful; the latter difficulty, however, was overcome, with improved results, by using 16 gr. of iodoform in an ounce of acetone for small ulcers, and for large and sloughing ones a 10 per cent solution of iodoform in eucalyptus oil. J. Dhur-Roy and A. Rakshit⁹ have used **Ultra-violet Rays** in a few cases of leprosy with promising results, and they recommend two to three minutes' exposures to ultra-violet rays from a quartz-mercury vapour lamp at a distance of thirty inches.

REFERENCES.—¹*Ind. Med. Gaz.* 1930, Nov., 620; ²*Arch. of Dermatol. and Syph.* 1929, Dec., 767; ³*Proc. Roy. Soc. Med.* 1930, March 6, 1370; ⁴*Jour. Trop. Med. and Hygiene*, 1929, Sept. 9, 214; ⁵*Amer. Jour. Trop. Med.* 1930, March, 83; ⁶*Lancet*, 1929, ii, 551; ⁷*Edin. Med. Jour.* 1930, Jan., 1; ⁸*Ind. Med. Gaz.* 1930, May, 274; ⁹*Ibid.* 257.

LEUKÆMIA.

Ivor J. Davies, M.D.

S. L. Warren¹ (Boston) has studied 28 cases of acute leukæmia, and presents a careful review of the literature. In this study acute leukæmia is considered as a definite clinical syndrome as distinguished from the two types of chronic leukæmia. There is indicated in the discussion the probability that most cases of acute leukæmia are of myelogenous origin, but it must be emphasized that

a distinction between a lymphogenous and myelogenous origin is often not possible in this acute syndrome. A comparison of the pictures or plates in the articles of the various authors will convince any critical observer that the differentiation between the immature non-granular cells upon a purely morphological basis is unsafe and perhaps unsound. Myeloblasts cannot readily be distinguished from immature lymphoid cells except by some differential staining method like that used by F. R. Sabin.² Until hæmatologists and pathologists come to an agreement upon blood-cell types and their origin—and this presupposes that we have a simple differential method of recognizing these types—the differential diagnosis between different types of acute leukæmia will be difficult to make. The supravital staining technique (F. R. Sabin, C. R. Austrian, R. S. Cunningham, and C. A. Doan³), if it were more generally used, would demonstrate that usually in acute leukæmia the mononuclear cells are myeloblasts, occasionally monocytes, and seldom lymphocytes. The duration is so short and the stimulus to produce cells is so great that the appearance of the cell masses is decidedly neoplastic. The process concerns an atypical, primitive, or embryonic cell-type which is acting much like a neoplasm, so that all of the various primitive and atypical forms are to be seen in the tumours or cell masses.

The following conclusions are drawn from Warren's study of 113 autopsical cases of acute leukæmia, inclusive of his 28 new cases: (1) Acute leukæmia is not a rare disease. (2) The constancy of the history, course, and clinical, blood, and tissue findings in acute leukæmia is noteworthy, regardless of whether the case is considered to be of myelogenous or lymphogenous origin. (3) It is essentially a disease of infant and young adult males, but in the fourth decade of life (the menopause period) females are more frequently involved. (4) The duration is short: 84 of the 113 cases died within two months of the onset of symptoms clearly due to the leukæmia. (5) Acute leukæmia of myelogenous origin frequently is diagnosed incorrectly as lymphogenous in type because the primitive bone-marrow cells are mistaken for lymphocytes. Supravital stains aid in distinguishing the type of leukæmia. (6) A case with unusual nodules in the stomach mucosa, skin, tongue, and lungs is described.

Supravital Staining of Large Mononuclears.—J. A. McLean⁴ (Pahran Australia) describes the technique of supravital staining of the large mononuclear cells in infectious mononucleosis and the acute leukæmias, with particular reference to their origin in the former disease. By supravital staining is meant the application of certain dyes, notably neutral red and Janus green, to living blood-cells. The dye, which is so diluted as not to impair the vitality of the cell, is taken up in a characteristic way. The Janus green stains the mitochondria which are present in the cytoplasm as small rod- or coccus-like bodies. These mitochondria are particularly in evidence in growing cells, and are characteristic in certain cells with regard to number, distribution, and arrangement, as will be described later. The neutral red appears as granules or small vacuoles which vary in number, size, and distribution in different cells. The following summary is drawn from McLean's paper:—

1. The differentiation of various large mononuclear cells encountered in routine hæmatology is more definite when an examination of stained fixed films is supplemented by the supravital method of staining.

2. The technique of the supravital method is described.

3. A case of infectious mononucleosis is reported in which a detailed blood examination, including supravital staining, was made, and the morbid histology of a swollen axillary lymphatic gland was studied. The large mononuclear cells in the circulating blood did not react to the peroxidase test, and with supravital staining showed a rosette of neutral-red granules in the indentation

of the nucleus. Similar cells were present in lymphatic-gland smears. Microscopically a lymphatic gland was seen to contain swollen endothelium of lymph sinuses and many free and fixed large mononuclear cells in the substance of the gland. Arneith's index had a shift to the left.

4. A case of acute myeloid leukæmia is reported. There were 2 per cent of polymorphonuclear leucocytes, and the majority of the cells comprised large mononuclears which did not react to the oxidase test, and which when examined by the supravital method were identified as myeloblasts and immature myelocytes.

5. A case of acute lymphatic leukæmia is reported. The predominating cell in the blood picture was the small lymphocyte. There were 5 per cent lymphoblasts which with supravital staining manifested the characteristic clumping of mitochondria.

6. Previously reported cases of infectious mononucleosis in Australia, England, and America are cited. The clinical characteristics of the disease are described, and the nature and origin of the predominating large mononuclear cell are discussed. It is concluded that the cell is identical with McJunkin's lymphendotheliocyte and is formed by a proliferation of reticulo-endothelium of lymphatic glands and spleen.

7. The difficulty of arriving at a positive diagnosis of acute myeloid leukæmia is stressed, and the value of supravital staining in helping to establish such a diagnosis is made evident.

8. The predominating cell in the case of acute lymphatic leukæmia was the small lymphocyte. The conception that the large lymphocyte characterizes this disease is probably based on wrongly diagnosed cases of acute myeloid leukæmia.

Myelocytic Leukæmia following Trauma.—S. C. Lewsen⁵ (London) reports an instance of myelocytic leukæmia following trauma. Forty cases are tabulated from the literature, and from the table it appears that the type of trauma may be classified as: (1) Blow to long bones or ribs, which may or may not result in a fracture; (2) Blow in the region of the spleen, sometimes rupturing that organ; (3) A general severe shaking. All the cases of leukæmia following trauma have been of the myeloid variety; there is no evidence of a lymphocytic leukæmia or of an erythræmia beginning in the same way through proliferation of the corresponding type of cell. Obviously, trauma cannot be regarded as the cause of all myeloid hyperplasia, and even in those cases where it is causative it is probably not wholly responsible. Reference is made to the medico-legal aspect of the type of case. In the German series a note about compensation was found in four cases. Three of the cases were awarded pensions on the assumption that the trauma received at work was responsible for the consequent illness. The fourth case was refused compensation. Compensation was refused by the Courts in the present case.

Priapism.—I. I. Kaplan⁶ (New York) describes a case of myelogenous leukæmia complicated by persistent priapism and which responded very favourably to **X-ray Therapy**.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1929, Oct., 490; ²*Physiol. Reviews*, 1922, ii, 38; ³*Jour. of Exper. Med.* 1924, xl, 845; ⁴*Med. Jour. of Australia*, 1929, Nov. 23, 734; ⁵*Lancet*, 1930, i, 288; ⁶*Med. Jour. and Record*, 1929, Dec. 18, 690.

LIGHT TREATMENT. (See PHOTOTHERAPY; TUBERCULOSIS, SURGICAL.)

LINDAU'S DISEASE.

Macdonald Critchley, M.D.

No disease has attracted so much attention of recent years in neurological circles as the association of hæmangioma of the cerebellum with angiomatosis retinæ—better known as Lindau's disease. It has been realized for over fifty

years that 'simple' cysts of the cerebellum may often contain a small nodule of angiomatous tissue on their inner walls (Hughlings Jackson). Our present conceptions, however, date from a careful pathological study of a large series of cerebellar cysts, carried out by A. Lindau¹ in 1926. Lindau divided his specimens into six sub-groups, and his Group IV comprised cysts arising in association with a tumour. Some of these were gliomatous in nature, others angiomatous. From this point Lindau concentrated on the angiomatous cysts, and, finding in one instance that there was a coexistent angioma of the retina, he investigated cases of the so-called hæmangiomatosis retinae (of Treacher Collins), also known as Von Hippel's disease. It was then discovered that a

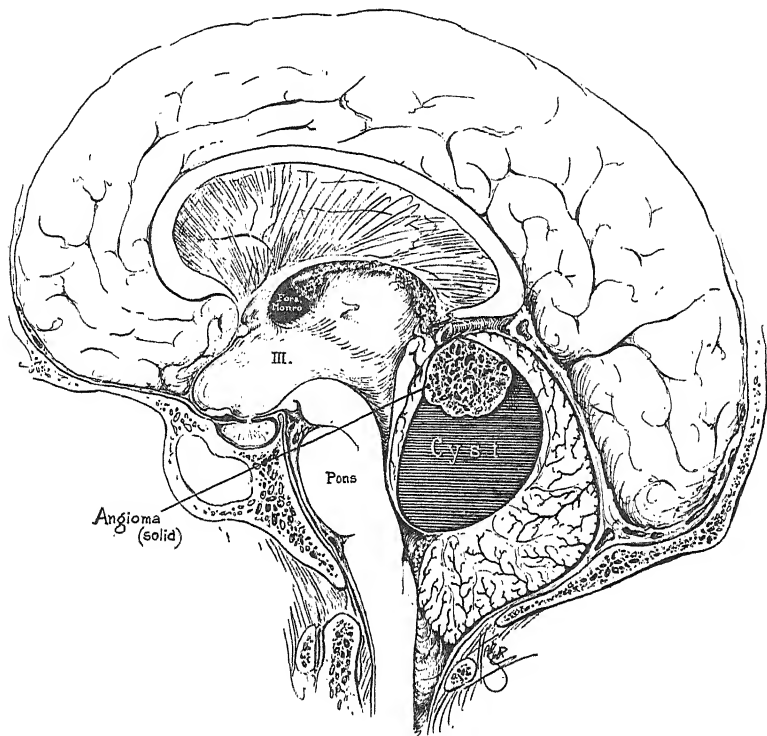


Fig. 39.—Solid angiomatous cyst situated directly over the mid-brain, as seen at operation.
(By courtesy of 'Archives of Surgery'.)

number of patients who had suffered from retinal angiomata also had angiomata of the cerebellum or of some other part of the body (Seidel,² Berblinger,³ Heine,⁴ and Ledebur). Lindau then laid it down that hæmangiomatous cysts of the cerebellum were merely isolated manifestations of a general developmental disorder, characterized by the occurrence of tumours of analogous nature elsewhere. For this condition van der Hoeve has suggested the cumbersome term 'angiophakomatosis universalis' (from *φακός* = *nævus*), but the title 'Lindau's disease' has been adopted almost everywhere. A series of monographs and case reports has since appeared—notably the papers of W. E. Dandy,⁵ H. Cushing and P. Bailey,⁶ P. Sargent and J. G. Greenfield,⁷

G. Hadfield,⁸ and A. F. Sladden.⁹ A discussion by the combined sections of Neurology, Ophthalmology, and Surgery was held at the Royal Society of Medicine on Nov. 13, 1930, at which contributions were read by Lindau, Treacher Collins, and others.

The Cerebellar Cyst.—This is usually situated in one of the lateral hemispheres. In some instances bilateral tumours have been recorded (Sargent, Greenfield, Sladden). The feature of greatest importance lies in the presence of a tumour in relationship with the wall of the cyst. In some cases, indeed, the cyst has been very small in size or even absent. The tumours are rounded, well-demarcated nodules, most frequently connected with the posterior wall, and mostly in association with the grey matter of the cerebellum. They vary in diameter from 2 mm. to 2 cm., but there is no constant relationship between the bulk of the tumour and the size of the cyst. Histologically the nodules consist of a mass of capillary vessels lying in a fibrous stroma. The endothelial lining cells tend to swell and to lie free in the lumen, in some cases filling completely the vascular channel. Some of the endothelial cells become loaded with fat or show vacuolation; multinucleated forms may occur. Some of the specimens recall cellular endotheliomata. The cyst wall consists usually of sclerosed neuroglial tissue without a lining membrane. The cerebellum is almost always the intracranial site of election for the angiomatic cysts, but there is evidence that very rarely they may also occur in the cerebral hemisphere. (Fig. 39; *Plates XXV, XXVI.*)

Retinal Angiomatosis.—Vascular tumours of the retina are frequently associated. The discovery of the ocular defect may antedate by many years the appearance of cerebellar symptoms. Usually the tumour consists of a vascular knot situated far out in the periphery of the retina; dilated and engorged vessels are often seen leading to and from the angioma. There may be an associated proliferative retinitis.

The appearances conform to the descriptions of 'hæmangiomatosis retinæ' given by Fuchs, Collins, von Hippel, Coats, and others. It is certain that retinal angiomas are not present in all cases of Lindau's disease, though it is highly probable that the peripheral parts of the retina have not been subjected to close scrutiny in all cases of cerebellar angiomas. Moreover, as Lindau has pointed out, the retinal angioma may be microscopic in dimensions.

In one very interesting case reported by Sladden, the patient's ocular condition had been recorded by Thomas and Coats under the title of "A Peculiar Granuloma of the Retina", and the eye had been removed. Twenty years later, when the diagnosis of Lindau's disease had been established at autopsy, the excised eye was re-examined, and proved to be an angioma, with a high proportion of endothelial cells and relatively slight formation of blood-spaces. (*Plate XXVII.*)

Association with Tumours Elsewhere.—

The retina is not the only associated region for the appearance of new growth, as tumours of polycystic character or of angiomatic type have also been described in Lindau's disease in the



FIG. 40.—The renal tumour from the same case as shown on Plate XXVIII. (G. Hadfield.) (By courtesy of the 'Bristol Medico-Chirurgical Journal'.)

PLATE XXV

LINDAU'S DISEASE

(P. SARGENT AND J. G. GREENFIELD)



Fig. A.—HÆMANGIOMATOUS CEREBELLAR CYST. Horizontal section of cerebellum looked at from below. Tumour and cyst are seen in the right hemisphere. The dentate nucleus lies close to the cyst wall.

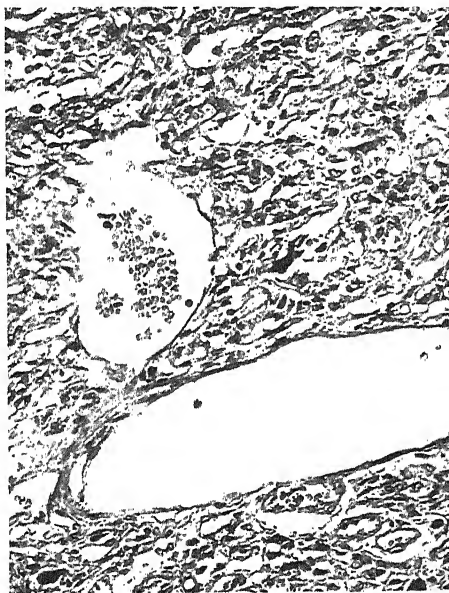


Fig. B.—SECTION OF A HÆMANGIOMATOUS CYST OF THE CEREBELLUM, showing large blood spaces, and a few large darkly staining nuclei.

*Plates XXV and XXVI by kind permission of the
"British Journal of Surgery"*

PLATE XXVI

LINDAU'S DISEASE—*continued*

(P. SARGENT AND J. G. GREENFIELD)

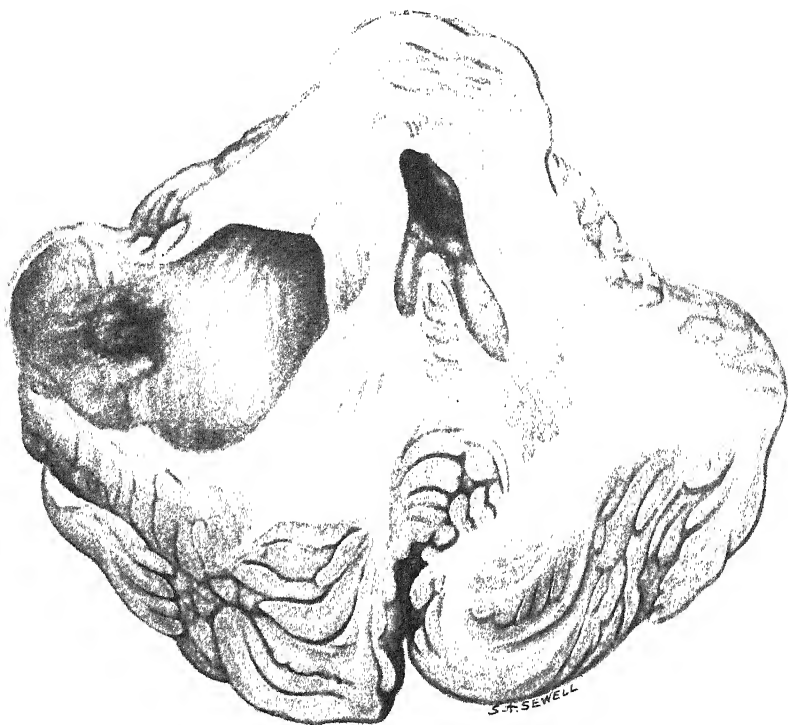


Fig. C.—HEMANGIOMATOUS CYST OF CEREBELLUM. Horizontal section of cerebellum and pons viewed from above.

PLATE XXVII

LINDAU'S DISEASE—*continued*

(A. F. SLADDEN)

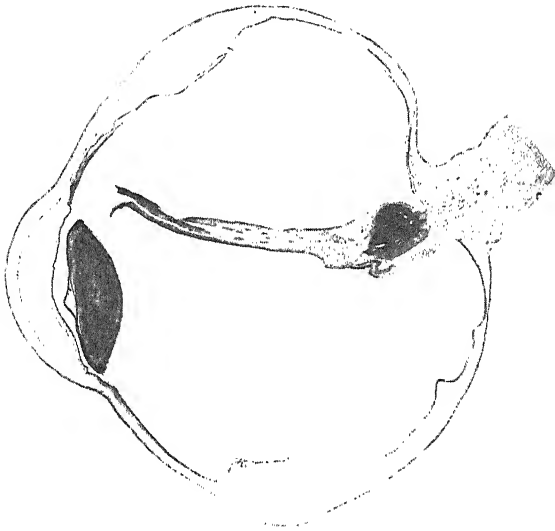


Fig. D. - Showing the appearance of the retina.

By kind permission of the
'British Journal of Ophthalmology'

PLATE XXVIII—LINDAU'S DISEASE—continued
(G. HADFIELD)

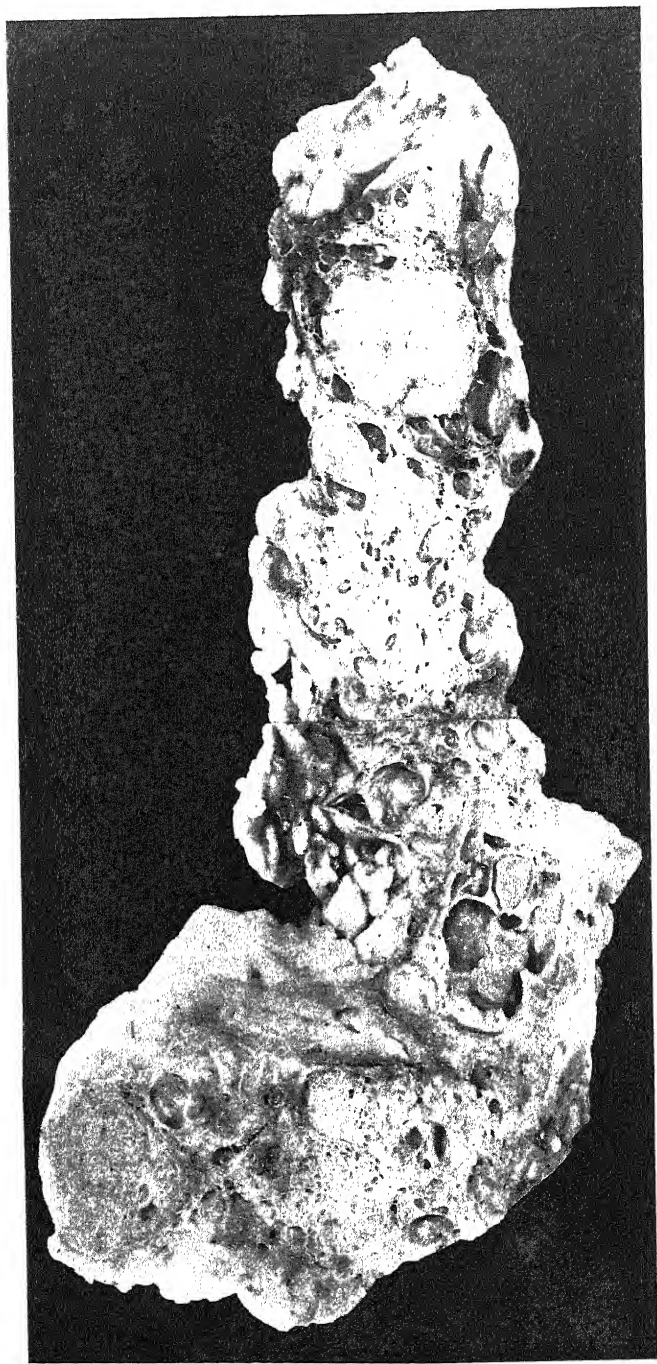


Fig. F.—POLYCYSTIC DISEASE OF PANCREAS. (Four-fifths natural size.)

By kind permission of the 'Bristol Medico-Chirurgical Journal'

medulla and spinal cord, in the pancreas, liver, kidneys, and epididymis (Plate XXVIII and Fig. 40.) Hypernephromata have also coexisted in cases of Lindau's disease, along with visceral angioma. Unlike the angioma of the cerebral hemispheres, the cerebellar angioma never seem to be associated with nævoid areas in the skin.

Familial Incidence.—With a wider knowledge of the complexity of Lindau's disease, we now realize that more than one member of a family may be affected. Instance of familial occurrence has been recorded, amongst others, by Lindau, Seidel, Cushing and Bailey, and Sargent and Greenfield. In a family recorded by H. U. Møller,¹⁰ no fewer than six members were affected.

The rôle of Trauma.—Sargent and Greenfield first drew attention to the possible etiological factor of trauma in cases of Lindau's disease. A history of severe head injury occurring shortly before the onset of cerebral symptoms was demonstrable in the case of the two brothers reported by Seidel. It was also present in one case out of eleven described by Cushing and Bailey, two of Sargent and Greenfield's seven patients, and also in the cases recorded by Sladden and by Hadfield. A possible relationship between injury and the development of cystic degeneration of angioma has been discussed by Sargent and Greenfield.

The Nature of Lindau's Disease.—It is probable that the growths are of congenital nature and that the disease is traceable to a maldevelopment occurring as early as the third month of foetal life. The occurrence of cysts in association with the cerebellar angioma is not easily explained. Williamson's theory, that the cyst arises by liquefaction and degeneration of the vascular tumour, is almost certainly incorrect. More probably an exudation of plasma from the angioma can be regarded as the pathogenic factor, and it is possible, as Sargent and Greenfield have suggested, that trauma may play a part in causing or accelerating such a process.

The lesson which Lindau's disease teaches is that every suspected case of cerebellar neoplasm should be investigated along the lines of: (1) family history, (2) presence of trauma, and (3) meticulous scrutiny of the retina, especially of the peripheral regions.

REFERENCES.—¹*Acta Pathol. et Microbiol. Scand.* 1926, Suppl. No. 1; *Acta Ophthalmol.* 1927, iv, 193; ²*38 Versamml. der ophthal. Gesells.* 1912, xxxviii, 335; ³*Græfe's Arch.* 1922, ex, 395; ⁴*Zeits. f. Augenheilk.* 1923, li, 1; ⁵*Arch. of Surg.* 1928, xvii, 715; ⁶*Tumours arising from the Blood-vessels of the Brain*, London, 1928; ⁷*Brit. Jour. Surg.* 1929, xvii, 84; ⁸*Bristol Med.-Chir. Jour.* 1929, xli, 211; ⁹*Brit. Jour. Ophthalmol.* 1930, xiv, 224; ¹⁰*Ugeskr. f. Læger*, 1930, April 17, 379.

LIP, CANCER OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

J. T. Stevens¹ states that every case of malignancy of the lip should receive both pre-operative and post-operative **Irradiation** either with the Roentgen rays or radium, or both, as indicated. Some surgeons object to pre-operative irradiation because of the delayed healing caused by such treatment. This delay is due to the lapse of too much time between the irradiation and the operation itself. The operation should take place forty-eight hours after the preliminary irradiation. **Electrothermic Surgery** is advocated by this writer. In an interesting paper he points out how a multitude of terms are used to designate one and the same procedure—'surgical diathermy', 'fulguration', 'endothermy', etc. He recommends the universal use of the terms 'electrothermic desiccation' and 'electrothermic coagulation'. These terms convey the fact that there is a production of heat by an electric current of sufficient intensity to desiccate or coagulate the tissues to which the current is applied. The advantage of the electrothermic method is that malignancy is destroyed before it is removed. The actual cautery does not produce sufficient heat deep

down in the tissues, and therefore the results of the treatment of pre-malignant and malignant lesions of the lip by means of the actual cautery fail to compare with those obtained by means of electrothermic surgery. Under gas-oxygen anaesthesia the Oudin or monopolar current is applied for the smaller lesions, the pointed electrode being held close to the tissue so that sparking occurs. The lesion is completely encircled with a dried-out wall of proper depth, caused by the discharge of the sparks into the tissues. This wall must be placed in the healthy tissues at some distance from the actual lesion. This is the most important part of the operation. The lesion itself is then completely desiccated by sparking as already described. If necessary, the needle may be run into the lesion, producing deeper desiccation. The desiccated tissues are next removed with a curette, and if all the unhealthy tissues have not been completely desiccated, further desiccation is immediately carried out. The process is known as the 'electrothermic desiccation technique'. In the larger malignant lesions electrothermic coagulation is employed. The bipolar current is used. Deep heat in any quantity is obtained. Any tissues of the body, including bone, can easily be destroyed.

REFERENCE.—*Amer. Jour. Surg.* 1929, Dec., 831.

LIPODYSTROPHY.

Ivor J. Davies, M.D.

F. P. Currier and D. B. Davies¹ (Grand Rapids, Mich.) report a case of progressive lipodystrophy appearing after the menopause. This disease usually appears in the first or second decade, and is characterized by a striking loss of subcutaneous fat over the upper part of the body down to about the level of the umbilicus, while the fat below that level is either normally retained or markedly increased. They cite a case of Lorain-Levi type of pituitary dystrophy to show a possible association of endocrinopathy and progressive lipodystrophy. A high cholesterol and total lipid content in the blood of both the patient and her son suggests the possibility of a familial disturbance in fat metabolism. However, they would hesitate to say it has any significance as regards the etiology of the disease.

H. Smith² reports a case of the same affection appearing after the menopause, but the lipodystrophy involved the lower extremities rather than the upper part of the body as is usual in the disease.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, June, 750; ²*Ibid.* 758.

LIVER ABSCESS. (See AMOEBIASIS; LIVER, SURGERY OF.)

LIVER, DISEASES OF.

Robert Hutchison, M.D., F.R.C.P.

Hepatitis Due to Cinchophen Compounds.—II. S. Reichle¹ gives references to previous cases of cinchophen toxicosis (47 in all, 10 fatal) and adds a case of his own. S. D. Anderson and D. P. Teter² also describe a fatal case of acute yellow atrophy due to oxyl iodide, a compound of cinchophen and iodine. All authors are agreed that the danger from this drug is not related either to the dose or to the length of administration, but that it depends upon an idiosyncrasy in the patient. Every patient taking cinchophen should therefore be watched for gastro-intestinal symptoms, rashes, or jaundice, and the appearance of any of these should lead to the immediate discontinuance of the drug.

Gall-bladder Infection.—E. R. Flint³ and W. Martin⁴ have independently investigated the relation between disease of the gall-bladder and the occurrence of hepatitis by examining, bacteriologically and otherwise, segments of liver removed at operation. Flint found that hepatitis seems to be very prevalent in many forms of intra-abdominal disease, but that it is specially

frequent and pronounced if the gall-bladder is affected. He thinks it most likely that the infection is conveyed to the liver either by the hepatic artery or by the portal vein; he does not believe in spread along the lymphatics, nor is it probable that it takes place via the bile-ducts.

As regards his bacteriological results, the most striking thing was the large number of negative findings in both the gall-bladder and the liver, and that when positive results were obtained the organisms in the majority of cases were those which grow normally in the intestine. He thinks that either the infecting organisms must die out readily or that infection is not so important in the production of disease in the gall-bladder as has been believed. If, also, organisms disappear so quickly from the gall-bladder, it seems unlikely that the latter can act as a focus of infection for more distant parts.

Martin's results are very similar to those of Flint. He too directs attention to the large number of negative bacteriological findings in the bile, gall-bladder, and adjacent liver tissue even in well-marked cases of cholecystitis; to the prevalence of types in the liver and gall-bladder that are normal for the intestinal tract; and to the finding in the liver tissue of bacteria that stain imperfectly and cannot be recultivated. He suggests that hepatitis when present with cholecystitis may be a coincident and not a consequent condition.

C. F. Branch⁵ has studied the bacteriology of 210 gall-bladders removed at operation. He found that in chronic cholecystitis the gall-bladder is infected in about 12 per cent of the cases, and in acute cholecystitis in 75 per cent. Approximately 40 per cent of gall-stones are infected. The chief organisms recovered were *B. coli*, streptococci, and staphylococci. Bile in which the bile-salts have a normal concentration has an inhibitory effect on bacterial growth.

H. Akaiwa and D. M. Sugano⁶ find, from the investigation of a considerable number of cases, that hypo-acidity of the gastric contents is present in 77 per cent of cases of gall-bladder disease. As the result of their post-operative findings they consider that the hypo-acidity is not the result of the gall-bladder disease, but a primary condition which favours infection of the bile-passages.

On the other hand, R. H. McDonald,⁷ in an investigation of 511 cases of gall-bladder disease, found normal acidity in 62 per cent and hypo-acidity in only 16 per cent. He found laboratory tests of little value in determining the best treatment in these cases, although of considerable help in diagnosis. The liver function tests were not reliable in minor degrees of failure of hepatic activity. As to treatment, he considers that surgical measures give the best results when the disease is localized in the gall-bladder; in 'gall-bladder dyspepsia' medical treatment is preferable. Taking all the cases, surgical treatment resulted in improvement in 73.6 per cent of those in which it was carried out; in the cases submitted to medical treatment only 67.8 per cent were improved.

(See also GALL-BLADDER, SURGERY OF.)

REFERENCES.—¹*Arch. of Internal Med.* 1929, Aug., 281; ²*Jour. Amer. Med. Assoc.* 1929, July 13, 93; ³*Brit. Med. Jour.* 1930, i, 1041; ⁴*Ann. of Surg.* 1929, July, 47; ⁵*New Eng. Jour. Med.* 1929, Aug. 15, 308; ⁶*Ann. of Surg.* 1929, Sept., 415; ⁷*Jour. Amer. Med. Assoc.* 1929, Dec. 7, 1805.

LIVER EFFICIENCY TESTS.

Robert Hutchison, M.D., F.R.C.P.

Since this subject was last considered (see MEDICAL ANNUAL, 1929, p. 271) little progress has been made. F. A. Coller and F. L. Troost¹ believe, however, that information of clinical value concerning the *glycogenetic function* of the liver can be obtained by a new interpretation of the usual

glucose-tolerance test. In a number of cases of hepatic disease they find that the glucose-tolerance test tends to be of the diabetic type, whilst on the other hand the fasting blood-sugar is low. In the presence of glycosuria, they believe, a low fasting blood-sugar level indicates that a patient is not suffering from diabetes but probably from an abnormal liver.

V. H. Cornell² has used the *bromsulphalein test* in a series of cases. This dye has replaced phenoltetrachlorophthalein as it is safer and a smaller quantity suffices. Direct injection of a 5 per cent solution is used without further dilution, and samples are taken at five- and thirty-minute intervals. The average five-minute retention in normal persons is 35 per cent. Having used the test in a considerable series of cases, Cornell concludes that it is of value in determining the presence of disease of the liver, a retention of above 50 per cent at five minutes being highly suspicious and, if combined with a thirty-minute retention, almost diagnostic.

The test is of special value: (1) In determining functional or structural damage to the liver in cases of disease of the gall-bladder or bile-duct; (2) In determining hepatic involvement in cases of malignancy; (3) In controlling anti-syphilitic arsenical treatment; (4) In determining the degree of residual disorder after acute disease of the liver; (5) In determining hepatic involvement in cases of tertiary syphilis; and (6) In confirming suspected disease of the liver without jaundice.

R. H. O. B. Robinson³ describes a modification in the technique for *estimating the amount of cholesterol in the blood*. He finds that, although the average value is raised in the subject of cholelithiasis, estimation in any individual case is of no use in diagnosis.

REFERENCES.—¹*Ann. of Surg.* 1929, Oct. 1, 781; ²*Arch. of Internal Med.* 1929, Dec., 818; ³*Lancet*, 1929, ii, 540.

LIVER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Amœbic Abscess.—H. Costantini,¹ of Algiers, points out that the treatment has been radically altered for the better by the introduction by Leonard Rogers of **Emetine**, which will by itself cure amœbiasis of the liver in the pre-suppurative stage, and has reduced the post-operative mortality from 50 per cent to under 10 per cent. The pus is often sterile. About 11 per cent liver abscesses are infected (Lacaze and Melnotte). The sterile cases may well be closed after incision; this greatly shortens the time of healing. An immediate microscopic examination of the pus should be made to determine the wisdom of draining or of closing. The sutures in the liver should be as close-set as possible, and the liver attached by stitches to the integument, as a safeguard.

C. L. Wilmoth² advocates demonstration of the cavity of the abscess by means of iodized oil introduced when the pus is aspirated, skiagrams being taken immediately. The normal treatment ought to be **Emetine and Aspiration**, but if this fails it is useful to know where the abscess is so that it may be re-aspirated or incised the more easily. A few cases can be cured by emetine alone. Emetine should be continued during convalescence, and later. (See also AMŒBIASIS.)

Cirrhosis.—T. Tannahill³ describes a method of operating in which, in addition to omentopexy, a pair of smooth glass buttons devised by Paterson and shaped like a collar-stud are introduced into the abdominal wall so as to make a communication between the abdominal cavity and the subcutaneous tissues and the space in front of the rectus muscle. He quotes a very successful case.

Secondary Cancer of the Liver.—J. A. Bargen and F. W. Rankin⁴ review

116 cases of cancer of the colon and rectum in which the liver functions were studied by means of hepatic efficiency tests, particularly the *bromsulphalein* test. They believe that strong suspicion may be raised that there is a metastasis in the liver by the use of this test, and the patient be spared a useless exploration.

REFERENCES.—¹*Presse méd.* 1929, Nov., 1511; ²*Amer. Jour. Surg.* 1930, May, 983; ³*Brit. Med. Jour.* 1930, i, 281; ⁴*Ann. of Surg.* 1930, Feb., 225.

LOOSE BODIES IN THE KNEE-JOINT. (See KNEE-JOINT, LOOSE BODIES IN.)

LUNG, ABSCESS OF.

W. H. Wynn, M.D., F.R.C.P.

C. J. Bucher¹ has made a bacteriological study of material aspirated with the bronchoscope from 118 cases of lung abscess in Chevalier Jackson's clinic; 20 of the cases were studied by anaerobic methods. The most frequent organism was the streptococcus (79 per cent); *Str. viridans* was found most often and after that *Str. hemolyticus*. The abscesses in which the latter was found were all very acute and the patients very ill. Anaerobic streptococci were the commonest of the strictly anaerobic micro-organisms. A pneumococcus was found in 42 per cent, mainly of Group IV; no Type I pneumococci were found. *Staphylococcus albus* was found in 31 per cent and *Sta. aureus* in 19 per cent. Many of the latter were hemolytic and occurred in severe cases. *B. influenzae* was found in 34 per cent. Fusiform bacilli and spirochaetes were present in 22 per cent. The spirochaetes were not all of one kind, and seemed to represent a variety of organisms more or less closely allied. In these cases the sputum was not particularly foul and the patients were not very ill. Spirochaetes might be found in abscesses following operations—prostatectomy, for example—in a remote part of the body. Various other organisms, both aerobic and anaerobic, were found in small numbers, but did not seem to have any special significance, and it was not possible to pick out any one organism as the etiological factor. There was a marked similarity between the micro-organisms found in the abscesses and those common to the mouth and upper respiratory tract. It seems justifiable to conclude that if aspiration of mouth bacteria is not the cause of abscess, the bacteria are at least the potential source of further infection.

Chevalier Jackson² records the cure of lung abscesses by repeated **Bronchoscopic Aspiration**. The acute cases in which bronchoscopy was considered advisable were attributable to the usual factors—influenza, pneumonia, operations, parturition, acute infections, and so on. A large majority, however, followed tonsillectomy, and the best results were obtained with this group, probably because early opportunity for treatment was most often afforded. Of 224 patients with abscess following operations on the tonsils and upper air-passages treated by bronchoscopic aspiration, 136 (61 per cent) were apparently well and symptom-free when last seen; 32 (14 per cent) were unquestionably improved; 24 (11 per cent) were worse or unimproved; 24 (11 per cent) were referred to the surgeon. There were 8 deaths (3 per cent) while the patients were under bronchoscopic treatment, though none could be attributed to the treatment. The terminal phases were cerebral complications in 2, cardiac complications in 1, extension of the suppurative process in 3. In many cases three or four aspirations were sufficient to restore to the lung its defensive power and to make the cough effective.

H. Tilley³ considers that the greater frequency of abscess after tonsil operations in the United States is probably because many of the surgeons operated with the patients in the sitting position or with the head and shoulders raised.

In these circumstances, blood, septic material, or portions of tissue were almost certain to gravitate towards the larynx and trachea. He considers bronchoscopy to be a valuable aid to treatment of pulmonary abscesses. Tudor Edwards¹ finds bronchoscopic lavage and aspiration disappointing and, unless a gross foreign body is present, that it would not appear to justify more than a short trial.

L. S. T. Burrell² considers that, if the abscess communicates with a bronchus, the safest procedure is to collapse the lung by **Artificial Pneumothorax** as soon as a diagnosis is made. If adhesions have already formed or the abscess is superficial, there is much danger of a rupture producing a pyopneumothorax. For this reason artificial pneumothorax should be discontinued if the pleura is adherent over the abscess and drainage by operation employed. The hypothetical objections to artificial pneumothorax are: (1) That by blocking some of the bronchi drainage is prevented or hindered; (2) That although the lung is collapsed, the wall of the abscess is not; (3) The danger of rupture into the pleural cavity is increased. Burrell considers that these objections apply only to cases left too long, and that in cases seen many months after the abscess formed, pneumothorax is hardly ever of value, but if carried out in the early stages it will prevent an abscess from spreading through the lung tissue, and one will hardly ever see a small abscess develop into a large infiltrated area of pus if the lung is collapsed sufficiently early. He does not agree with the initial period of expectant treatment. Tudor Edwards holds that medical treatment should always be given an opportunity before surgical treatment is advised. **Postural Drainage** should be instituted if bronchial rupture has occurred. The patient should occupy the optimum position for gradually increasing periods two or three times a day. Intravenous injections of organic **Arsenio** should be given for their action on spirochaetes, which are almost invariably present. Artificial pneumothorax has a definite field of usefulness in those abscesses situated in the hilum, but the diagnosis must be made by antero-posterior and lateral skiagrams to define their position exactly. **External Drainage** should be undertaken in all cases which fail to clear up by medical means. Operation should be under local anaesthesia unless strongly contra-indicated. Upper-lobe abscesses should be approached through the upper axilla unless situated posteriorly, the lower-lobe abscesses posteriorly, and those in the middle lobe through an anterior incision. The abscess cavity is emptied by posture one hour before operation, and the operation should be done in one or two stages according to the presence or absence of adhesions shutting off the main pleural cavity. **Phrenic Evulsion** is of considerable value for three reasons: (1) Occasionally basal abscesses which have ruptured into a bronchus will heal completely with this operation without external drainage; (2) An early phrenic evulsion will often prevent the onset of secondary bronchiectasis and even cure early cases; (3) By relaxation of the lower part of the lung it will hasten the healing of large abscess cavities. **Thoracoplasty** should only be required in cases in which, as a result of late diagnosis or inadequate treatment, a generalized bronchiectasis supervenes, or in certain cases when secondary infection of the pleura has supervened. Forty-five cases were submitted to operation, comprising all types from the gangrenous to the chronic simple abscess. All had had adequate medical treatment. In 4 the abscess was secondary to carcinoma of the lung, and these cases still survive the operation for periods varying from six weeks to four months. Of the remaining 41, 8 have died—a mortality of 17·7 per cent.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, March, 406; ²*Proc. Roy. Soc. Med.* 1930, Nov. 1: ^{3,4,5}*Ibid.* (Med. Sect.) 1930, Feb. 25.

A. Tudor Edwards, M.Ch., F.R.C.S.

SURGICAL TREATMENT OF PULMONARY SUPPURATION.

Pulmonary Abscess.—In a discussion on pulmonary abscess, F. G. Chandler¹ states that he is sceptical of the value of bronchoscopy in this condition and regards artificial pneumothorax as not without dangers. These are: (1) The danger of enclosing necrotic material when there is not adequate bronchial drainage; (2) The risk of rupture of the abscess into the pneumothorax. As regards medical treatment, he rightly stresses the treatment of oral and nasal sepsis, and advises rest in bed, postural drainage, inhalation, and the administration of **Arsenic**.

A. Tudor Edwards in the same discussion advocated early medical treatment, but advised surgical drainage if the condition was deteriorating or becoming chronic. The necessity for careful X-ray localization before operation was emphasized. When there was the slightest doubt the two-stage operation was indicated, the first stage being to ensure pleural adhesions over the abscess. The value of **Phrenic Evulsion** in preventing secondary bronchiectasis and allowing a persistent fistula to heal was also indicated. About 10 per cent of pulmonary abscesses are secondary to new growth of the lung. The operative mortality was 17·7 per cent in 45 cases.

G. P. Muller,² in a paper on the mortality and end-results of operation for abscess of the lung, states that spontaneous recovery occurs in a certain proportion varying from 10 to 25 per cent. In his opinion **Bronchoscopic Aspiration** has proved its worth. **Artificial Pneumothorax** is of value in the occasional patient with a non-adherent lung, a single cavity near the hilum, and a free bronchial outlet. **External Drainage** must be required in 50 per cent of cases, and he advises operation in peripheral abscess, multiple abscess, and lobar bronchiectasis. The mortality in Muller's series of 35 cases—all the failures of other forms of treatment—was 28·5 per cent. They arose from cerebral abscess—two cases; and the others, in very debilitated cases, from pneumonic and from other extraneous causes. He advises **Cautery Excision** or **Lobectomy** for multiple abscesses, or in abscess associated with lobar bronchiectasis.

Bronchiectasis.—H. B. Brunn,³ in a paper on the surgical principles underlying one-stage **Lobectomy**, reports six cases in which this operation was performed with only one fatality. In five of these patients the condition was bronchiectasis, and in the other malignant disease. Considerable time was spent on the preliminary treatment, which consisted of rest, sunlight, postural drainage, and investigation and treatment of sinus infections. The operations were performed under positive-pressure gas and oxygen. The lobe is mobilized by division of adhesions until the smallest possible pedicle is made. The pedicle is clamped and divided with the cautery, leaving a generous stump, which is then sutured. The chest is now partly filled with saline, and positive pressure through the trachea is induced in order to test for hæmorrhage or air-leak of the stump. The chest is closed with an air-tight tube into the lowest point of the pleura. This series, although comprising very few cases, is a most encouraging one, and if these cases are of the complicated type the mortality-rate is considerably lower than in any other recorded group.

Persistent Bronchial Fistula.—E. H. Pool and J. H. Garlock⁴ state in a paper on the above that bronchial fistulæ occur most commonly after empyema and lung abscess, but that the majority heal spontaneously. The persistent fistula may be the result of continued lung suppuration, bronchiectasis, the presence of a rigid-walled empyema cavity, the formation of a bronchocutaneous channel, or the presence of a foreign body. Obviously, attempts at

closure of the fistula in the presence of active lung suppuration are doomed to failure. The operation advised by these authors, as a result of the experimental production of bronchial fistula in animals, is the insertion into the fistula of a pedunculated muscle flap. The flap apparently retains its character and is not changed into fibrous tissue, but the bronchial end becomes covered over by a growth of the bronchial epithelium. Three successful cases treated by this method are described.

Intrabronchial Drainage.—In an interesting paper on this subject H. Brunn and W. B. Faulkner, jr.,⁵ divide bronchial drainage into two types: (1) External—the emptying of a bronchus by cough and expectoration; (2) Internal—the spilling of pus or secretion from one bronchus into another on the same or opposite side. As a result of their study, these authors point out that the symptoms and signs in pulmonary suppuration are often more dependent upon the areas to which the pus drains than upon the actual site of the primary lung lesion, and therefore the diagnosis and successful treatment of pulmonary suppuration must be based upon an understanding of pathology.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1930, April, 757; ²*Ann. of Surg.* 1930, March, 361; ³*Arch. of Surg.* 1929, Jan., 490; ⁴*Ann. of Surg.* 1929, Aug., 213; ⁵*Surg. Gynecol. and Obst.* 1930, July, 115.

LUNG, APUTRID NECROSIS OF.

W. H. Wynn, M.D., F.R.C.P.

Leo Kessel¹ describes a condition which has not previously been recognized clinically, although Rosenthal in 1907 described a 'sequestration' or necrosis resulting from a thrombosis following lobar pneumonia. Kessel describes five cases recognized clinically, and three others in which the lung was examined post mortem. The condition produces no symptoms or signs. There is no increased cough, the sputum does not become foul, and there is no clubbing of the fingers. The condition is not suspected clinically, and is only revealed by a radiogram taken as a routine measure. The radiogram in these cases (*Plate XXIX, A*) shows within the shadow due to pneumonic infiltration an abscess cavity, often showing a fluid level, and up to two inches in diameter. Resolution appears to take place normally, and subsequent radiograms show a gradual disappearance of the cavity (*Plate XXIX, B*). The sequence of events seems to be as follows: Given the conditions that are conducive to thrombosis, as in the hepatization stage of pneumonia, there occurs a thrombosis of a vessel leading to a portion of the involved lung. The occurrence of this thrombosis is favoured by such conditions as the pulmonary compression exercised by the pulmonary exudate, compression of the capillary bed, increased coagulability of the blood, lowered blood-pressure, and myocardial failure. A portion of the lung becomes the site of infarction and necroses. The absence of cough and sputum is due to the absence of communication with a bronchus, which also explains the absence of anaerobic infection. The areas are easily overlooked in a cut section of the lung at autopsy (*Plate XXX*). If radiograms were taken as a routine in cases of resolving pneumonia, Kessel thinks that the condition would not infrequently be found.

REFERENCE.—¹*Arch. of Internal Med.* 1930, March, 401.

LUNG, ASBESTOSIS OF. (See ASBESTOSIS, PULMONARY; [INDUSTRIAL DISEASES.]

LUNG COMPLICATIONS, POST-OPERATIVE. (See PRE- AND POST-OPERATIVE TREATMENT.)

PLATE XXIX

APUTRID NECROSIS OF LUNG

(LEO KESSEL)

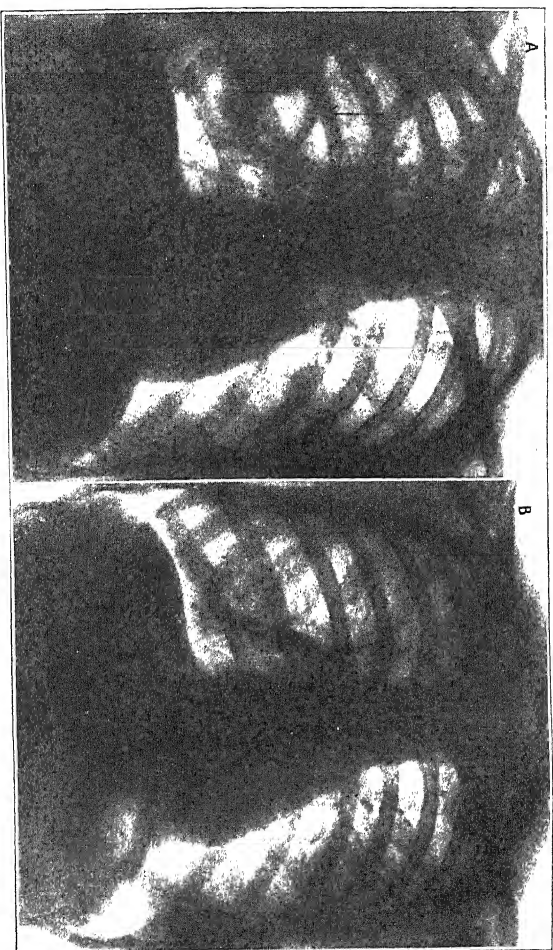


Fig. A.—The arrow points to a large cavity in the midst of the area of consolidation.

Fig. B.—Shows complete disappearance of the cavity one month later.

Photos XXIX and XXX by kind permission of 'Archives of Internal Medicine'

PLATE XXX

APUTRID NECROSIS OF LUNG—*continued*

(LEO KESSEL)

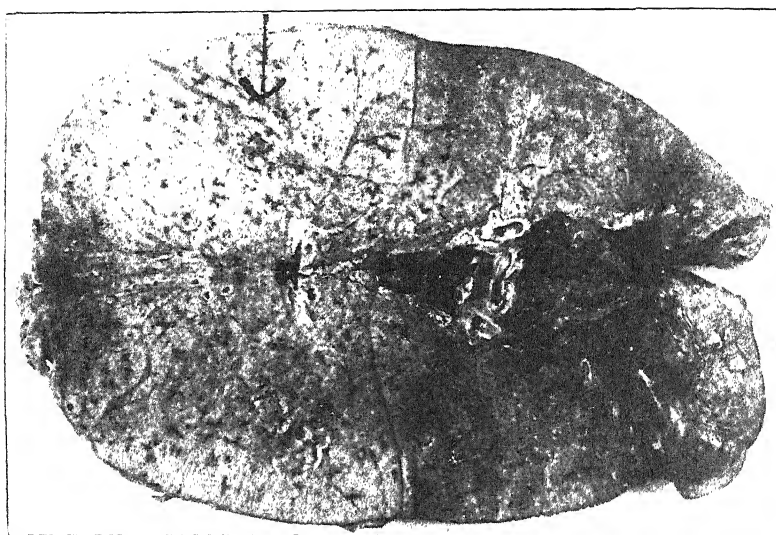


Fig. C.—Gross section of lung. The arrow points to the area of aputrid necrosis.

LUNG, MASSIVE COLLAPSE OF. *W. H. Wynn, M.D., F.R.C.P.*

H. Hennell¹ classifies cases of acquired massive collapse of the lungs into three main groups. *Group 1*: Cases in which gross bronchial obstruction is the manifest cause. *Group 2*: Cases in which the primary factor is an interference with the proper respiratory movements, with which is associated increased bronchial secretion and a suppression of the cough reflex. The accumulated and retained secretions eventually lead to bronchial occlusion with resulting atelectasis. *Group 3*: Cases in which extrabronchial pressure leads to partial stenosis, the complete occlusion probably being due either to swelling of the mucosa or to bronchial spasm, associated with plugs of retained inspissated secretions. In all these cases, following the bronchial occlusion, the alveolar air is absorbed and atelectasis results. *Group 1* includes the large number of cases in which obstruction is due to a foreign body, an endo-bronchial neoplasm, retained blood-clots, diphtheritic membrane, etc. *Group 2* includes the cases of collapse occurring as post-operative complications and those due to paralysis of the respiratory muscles. Here the primary factor is interference with the respiratory movements from paralysis, reflex inhibition, faulty posture, etc. When with this is associated an increase in the bronchial secretions and a suppression of the cough reflex, the bronchi will become occluded. *Group 3* is relatively small, and includes cases due to external pressure from neoplasms, aneurysm, and enlarged glands. The clinical picture is similar in all cases. The onset is usually sudden, with marked respiratory embarrassment and shock. The physical signs are: diminished movement of one side of the chest, narrowing of the interspaces, drawing over of the trachea and heart to the affected side and rise of the diaphragm, a flat percussion note, harsh or absent breath-sounds, and no râles. X-ray examination reveals a dense homogeneous shadow and corroborates the displacement of the trachea, heart, and diaphragm.

P. N. Coryllos² holds that post-operative collapse and post-operative pneumonia are two phases of the same morbid condition. The differences between them are of degree only and depend upon the type and virulence of their most frequent causative organism, the pneumococcus. Experimental work undertaken with G. L. Birnbaum³ has led him to the following conclusions: (1) There is only one determining cause of atelectasis—bronchial obstruction. The obstruction must be complete. (2) Neither paralysis of the respiratory muscles nor nervous reflexes can be determining causes. Posture, interference with the respiratory movements by pain or narcotics, and decrease of the means of defence of the lungs—cough, ciliary movements, etc.—act only as favouring causes. He holds the following theory. After operations, especially on the upper abdomen—and this independently of the anæsthetic used—an immobilization of the thoracic cage occurs, the vital capacity is decreased, and the means of defence of the lung are impaired. This impairment is increased by the post-operative position and narcotics. A stasis of bronchial secretion follows, producing an irritation of the bronchial mucosa. A bronchiolitis follows, which generally clears up as soon as the lung has regained its means of defence. On the other hand, favoured by the bronchitis, pneumococcus Type IV, a frequent saprophyte of the upper respiratory tract, can invade the lower respiratory tract and set up a pneumococcic bronchitis with viscid fibrinous secretion. The complication may remain in the state of bronchitis, and most often clears up in forty-eight hours; but in some cases a bronchial obstruction occurs, and from that time the result depends upon the virulence of the pneumococcus and the nature of associated organisms. If the virulence is low and the exudate poor in fibrin, a simple obstructive atelectasis will be caused by absorption of the alveolar air. This may be

lobar or lobular, according to the size of the obstructed bronchi. This complication will occur within twenty-four to forty-eight hours after operation. If the occluding mucus is expelled early by coughing—and it can be expelled because of its low viscosity—the affected lung will be rapidly aerated and symptoms will disappear. But if the virulence of the pneumococcus is high, the exudate will be more viscid, dislodgement of the plugs will not be easy, and an alveolar exudate is liable to follow and give a post-operative pneumonia. Coryllos considers that the theory explains the following features in collapse and post-operative pneumonia and the striking similarities between them. *In collapse*: its production within the first twenty-four to forty-eight hours after operation; its equal frequency after general, local, or spinal anaesthesia; that it occurs more frequently when a 'cold' existed previously; that it is favoured by the recumbent position, and is often prevented and cured by rolling the patient from side to side; that it is localized in 75 per cent of cases in the lower lobes; and that in every one of the cases bacteriologically examined pneumococcus Type IV was found. *In pneumonia*: the lobar distribution of lobar pneumonia; the smaller size of the affected lobes as compared with the healthy ones, and consequently the displacement of the mediastinum to the affected side; its appearance within twenty-four to forty-eight hours after operation; the constant presence of pneumococcus Type IV in the exudate; the great difficulty and often impossibility of a differential diagnosis between pneumonia and lobar collapse; the similarities in the pathological changes; and the same distribution with predominance in the lower lobes. On this theory, then, post-operative bronchitis, atelectasis, pneumonia, and possibly even abscess and gangrene, are the successive phases of one complication—bronchial occlusion.

G. W. Holmes³ describes the X-ray appearances in post-operative collapse. The involved area is denser than the surrounding lung, the heart and mediastinal contents are displaced towards the affected side, the diaphragm is high, and in the early stages there is an absence of respiratory excursions, the intercostal spaces are narrowed, but the costophrenic sinus is not usually obliterated. When only one lobe is affected the dull area will correspond to the region of the involved lobe, but the area is smaller. The lower margin is likely to be sharply defined, the upper rather mottled and indistinct. Frequently there is collapse of one lobe and partial collapse of an adjoining lobe. In some cases of massive collapse there is probably a considerable amount of fluid in the air-passages. In these the shadows are more dense and the outline of the diaphragm may be obliterated. Delay of the collapsed lung to expand may result in a chronic condition with a fairly characteristic X-ray appearance. A triangular area of dullness is seen between the diaphragm, the heart, and the normal lobes. The margins are sharply defined and the shadow is quite dense. The bronchi are dilated and there may be symptoms of bronchiectasis. (*See also X-RAY DIAGNOSIS.*)

TREATMENT.—W. J. M. Scott⁴ has found a great reduction in the incidence of massive post-operative collapse following the use of **Hyperventilation with Carbon Dioxide** at the close of operation as suggested by Yandell Henderson. In one series of 2000 major operations without hyperventilation 12 cases of massive collapse occurred—an incidence of 0.6 per cent, as low a figure as has been reported in any large series of cases, the reported figures running from this up to 1.5 per cent. In a second series of cases numbering 2850 there were 7 cases of massive collapse, or 0.25 per cent. But of the 7 cases it was found that only 3 had received hyperventilation, it having been omitted in 2 as the anaesthesia was short, and in 2 others who had local anaesthesia only. *Fig. 41* shows the effect of hyperventilation with carbon dioxide

on the depressed pulmonary ventilation at the close of operation. When collapse has occurred, Sante's method of rolling the patient on the unaffected side is advocated. This procedure is not applicable to the cases in which there is no cardiac displacement and which are called post-operative pneumonia. The only postural treatment available is to see that the patient does

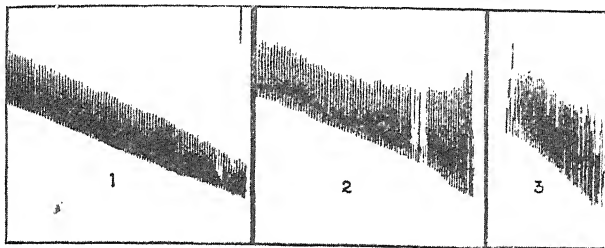


Fig. 41.—Spirogram of respiratory volume at the end of appendectomy (Benedict-Roth apparatus). The records read from right to left: (1) At the conclusion of operation; (2) One minute later after hyperventilation with carbon dioxide; (3) After about four minutes of hyperventilation. This shows the immediate effect of hyperventilation in increasing the depth and minute volume of respiration. (Re-drawn from the 'Journal of the American Medical Association'.)

not remain constantly in one position. Marked improvement was also obtained by giving CO_2 inhalations after collapse had occurred. No patients so treated had any important symptoms of collapse for more than twenty-four or forty-eight hours, whereas it was common previously for serious symptoms to last for a week or more. (See also PRE- AND POST-OPERATIVE TREATMENT.)

REFERENCES.—¹*Arch. of Internal Med.* 1929, Oct., 604; ²*Jour. Amer. Med. Assoc.* 1929, July 13, 98; *Arch. of Surg.* 1928, Feb., 501; 1929, Jan., 190; ³*Jour. Amer. Med. Assoc.* 1929, July 13, 100; ⁴*Ibid.* 101.

LUNG AND MEDIASTINUM, TUMOURS OF.

W. H. Wynn, M.D., F.R.C.P.

There is much difference of opinion as to whether the increase in primary carcinoma of the lung, noted by practically all observers, is a real absolute increase peculiar to the lung or only relative to and coincidental with a general increase in systemic cancer. P. O. Rosahn,¹ after a careful review of the statistics from various sources comprising over 120,000 autopsies, concludes that the increase is real and absolute (Fig. 42). Due allowance is made for the better diagnosis provided by modern facilities, the great advances in communication and transportation which make these facilities available over a wider area, and for other factors which would contribute to an apparent increase. But all these considerations

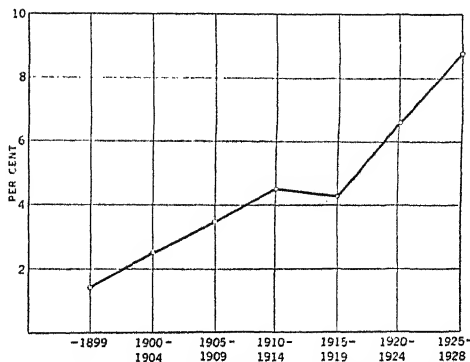


Fig. 42.—The percentage relation of primary carcinoma of the lung to all carcinomas. (Re-drawn from the 'American Journal of the Medical Sciences'.)

apply equally to carcinoma of any organ, and the rise in the proportion of lung carcinoma to total carcinomas appears to be definite evidence of an absolute increase in lung carcinoma.

M. Davidson² conveniently classifies cases of intrathoracic growths from the point of view of symptomatology into certain broad groups: (1) Patients who present themselves with evidence of a *pleural effusion*. The existence of a pleural effusion in older persons for which an infective cause is not obvious should raise a strong suspicion of a new growth, and if the fluid be uniformly blood-stained, the suspicion may almost amount to a certainty. (2) Those who seek advice on account of *hæmoptysis*. This is not uncommonly the only initial symptom. (3) Patients whose history and physical examination suggest the presence of *localized infection* within the chest. In these diagnosis may be very difficult. The signs and X-ray examination may suggest an interlobar empyema or a pulmonary abscess, and the temperature, sputum, leucocytosis, and general toxic appearance may seem to support the diagnosis. Even when pus has been aspirated, the real cause—a breaking-down neoplasm—may only be found post mortem. (4) The fourth group comprises patients who seek advice for a variety of chest symptoms, but in whom diagnosis is not obvious on ordinary examination. The bronchitic patient of middle age whose symptoms and general clinical condition appear to be incommensurate with the physical signs must be regarded suspiciously. Of the various symptoms, dyspnoea is perhaps the most important. When accompanying new growths its chief characteristics are its constancy and its tendency in the later stages to become paroxysmal, and the fact that it is often out of proportion to the extent of lung involved and the intensity of the physical signs. Cough and sputum are usually present, with occasional streaky hæmoptysis, but show nothing specially characteristic. Pain is a variable symptom, and if the pleura is involved may be very distressing, but in the earlier stages cancer of the lung seems to be relatively painless. Severe pain due to erosion of bone and accompanied by other signs of pressure is more likely to be found in growths of the mediastinum than in bronchial or pulmonary lesions. General weakness is usually complained of, but loss of weight is by no means a constant symptom. The patient often dates the onset of symptoms from an attack of 'influenza'. The explanation may be that in the early stages pulmonary cancer is symptomless, and that at a certain period in development the involvement of lung results in a definite reaction, in many cases owing to a secondary infection.

M. Fishberg and E. H. Rubin³ call attention to the frequency with which the dominant picture in carcinoma of the lung is that of pulmonary excavation simulating pulmonary abscess, tuberculous disease, or bronchiectasis. Fifteen cases of this kind which came to necropsy are reported. They consider that about one-third of primary neoplasms of the lung break down, leaving a cavity. The cavities are of various sizes, and in rare instances a whole lobe may break down. In all instances of apparently primary abscess of the lung of recent onset in elderly patients the possibility of a broken-down neoplasm must be borne in mind.

A. L. Punch,⁴ in an article on intrathoracic tumours generally, describes the symptoms of dermoids, teratomata, substernal thyroids, and hydatids. Dermoids and teratomata can only be distinguished after removal. Rarely they are said to remain small and to be discovered accidentally after death; more often they tend to increase in size, produce symptoms and signs, and if not removed cause death. Most of the cases have occurred between the ages of 20 and 30. They may reach a considerable size without producing symptoms of any severity. As the growth increases, cough, sputum, dyspnoea, and hæmoptysis occur from the irritation of the tumour. Should the tumour

rupture into a bronchus, the expectoration of hairs is observed and is diagnostic. After rupture septic infection occurs, and pyrexia and other signs of suppuration are found. Pressure symptoms are much less frequent than with other intrathoracic neoplasms. If situated in the mediastinum, few abnormal signs may be found until a considerable size has been reached; but if in the lung, impairment of percussion note, weakening of breath-sounds, and diminished voice conduction will be obtained. Routine examination of all chest conditions by X rays will render the detection of these tumours more frequent and at a stage when surgical removal is possible. The symptoms and signs of hydatid cysts are very similar to those of dermoids. An eosinophilia may be detected in the blood and the complement-fixation test is valuable, but it is difficult in this country to obtain the necessary antigen. A hydatid thrill may be discovered, but is difficult to find and is not pathognomonic. When the cyst ruptures, the patient is seized with sudden pain in the chest, intense dyspnoea, and the expectoration of large quantities of thin, blood-stained fluid having an unpleasant taste; this may be so profuse that the patient dies of suffocation. In other cases the chest is cleared and the distress relieved. Examination of the fluid may show portions of the cyst membrane with hooklets and scolices. In favourable cases the whole cyst may be expectorated in time and the hole in the lung closed. More often the cyst becomes infected and a pulmonary abscess results.

An intrathoracic enlargement of the thyroid is not very rare. It should be suspected in patients with signs of hyperthyroidism who show no enlargement of the thyroid in the neck. The only abnormal sign usually found is an area of impairment of percussion note beneath the upper part of the sternum extending outwards on both sides. It usually does not produce pressure on adjacent structures, but may do so. X rays confirm the diagnosis in a doubtful case.

The same author discusses the special diagnostic methods in cases of intrathoracic tumour. The routine examination with X rays is indispensable. Further information is obtained after injection of lipiodol which will show the relation of the trachea and larger bronchi to any shadow seen in an ordinary X-ray picture; the narrowing of one of the larger bronchi with dilatation of the bronchi distal to the narrowing, and the presence of complete occlusion of a bronchus causing collapse of the lung. Collapse of the lung by the introduction of air into the pleural cavity will show: (1) Whether a tumour is extrapulmonary, in which case the lung will be seen receding, leaving the tumour behind adherent to the chest wall; (2) Whether the tumour is embedded in the lung, when both will recede together; or (3) Whether both the tumour and lung are adherent to the chest wall, in which case the lung above or below will collapse, with no collapse at the site of the opacity. A large effusion can be aspirated and replaced by air before X-ray examination. Bronchoscopy may show the nature and site of any obstruction in one of the larger bronchi and whether due to a foreign body or growth. A portion of growth may be removed for microscopic examination. A diagnosis of growth is sometimes made by finding large so-called 'cancer cells' in the pleural fluid. But these, unless grouped together in large masses, are apt to be fallacious, as similar cells are found in other kinds of effusions. Very occasionally small pieces of growth may be found in the sputum. Negative examinations of the sputum for tubercle bacilli are strongly against a diagnosis of tuberculosis and so may support a diagnosis of neoplasm.

X-RAY APPEARANCES.—

Dermoid Cysts and Teratomata.—These produce a uniformly dense, rounded opacity with a well-defined margin projecting from the mediastinum or embedded in the substance of the lung. The surrounding lung is not involved,

and this fact, together with the rounded shape and the clear-cut margins, helps to differentiate it from a malignant growth. Sometimes the cyst grows out into the upper part of the thorax and reaches the chest wall, producing a dense opacity in this region extending from the mediastinum to the ribs, and possibly limited below by the interlobar septum. Such a cyst will thus lose its characteristic shape. The introduction of air into the pleural cavity will cause the tumour to recede with the collapsing lung, and its intrapulmonary position and rounded shape will be revealed.

Hydatid Cysts.—These produce a similar rounded opacity with well-defined margins. They are more often situated in the lower than in the upper part of the chest.

Lymphadenomata.—With lymphadenomata the glands in the superior mediastinum are most frequently involved. At first they appear as a rounded opacity projecting to one or other side. The margins are well defined. Later, as the mass enlarges, the opacity projects out on either side of the structures in the mediastinum. The margins become irregular, but are always well defined owing to the absence of lung involvement. The surrounding lung is compressed, but otherwise normal. A similar opacity will be seen at the hilus when the glands in that region are affected. It is not always possible to differentiate a lymphadenomatous from a cancerous growth.

Intrathoracic Enlargements of the Thyroid.—These produce a moderately dense opacity extending down from the upper end of the sternum into the superior mediastinum.

Primary Neoplasms.—

1. A tumour in the mediastinum produces a dense opacity protruding more to one side than the other, most often to the right. It usually has an irregular outline with ill-defined ragged margins. As the tumour grows it invades the lung and produces a dense shadow with striae radiating out into the lung tissue, but clearly defined from it.

2. A tumour producing occlusion of a large bronchus and collapse of the lung is the commonest type seen. An ordinary X-ray picture will show only a dense opacity at the site of the collapsed lung which may be either the lower or upper lobe, most often the former. The collapse is more frequent on the right side. When the lower lobe is affected the upper limit is usually sharply defined by the interlobar septum. It is rare at an early stage to detect the tumour by X rays, but sometimes a dense shadow can be seen at the hilus which can be differentiated from the shadow of collapsed lung. After the injection of lipiodol a typical picture is seen. Shortly beyond the bifurcation of the trachea the bronchus involved terminates. The proximal portion of the bronchus is cone-shaped and filled with lipiodol. No lipiodol will be seen in the lung beyond the apex of this opacity, all of it flowing over into other bronchi or into the opposite lung.

3. A tumour causing some pressure on a bronchus, instead of producing collapse of the lung, may give rise to bronchiectasis. An X-ray picture will show either a honeycombed appearance, usually at the base, or an increase of the linear striation at this site with apparent dilatation of the bronchi. The tumour itself is not usually seen. By the injection of lipiodol the narrowing of the bronchus can be shown, while the dilated bronchi beyond will be seen filled with the oil.

4. Endotheliomata of the pleura may be seen as a general want of translucency. In a few cases in which an effusion has occurred early, pushing the lung away and preventing adhesions, replacement of the fluid by air will show a typical appearance. Numerous plaque-like opacities may be seen scattered over the parietal pleura.

PLATE XXXI

NEW GROWTH OCCUPYING THE ROOT OF LUNG
AND SURROUNDING THE MAIN BRONCHUS

(M. DAVIDSON)



The outer part of the lung is collapsed, but otherwise normal, except for a metastatic deposit of growth in the lower lobe.

*Plates XXXI-XXXV reproduced by kind permission from
Dr. Maurice Davidson's 'Cancer of the Lung'*



Fig. A.—Carcinoma of left lung, parenchymatous type.
J.L. 1031



Fig. B.—Same case as Fig. A, ten months later.

PLATE XXXIII.—CARCINOMA OF LEFT LUNG (M. DAVISON.)

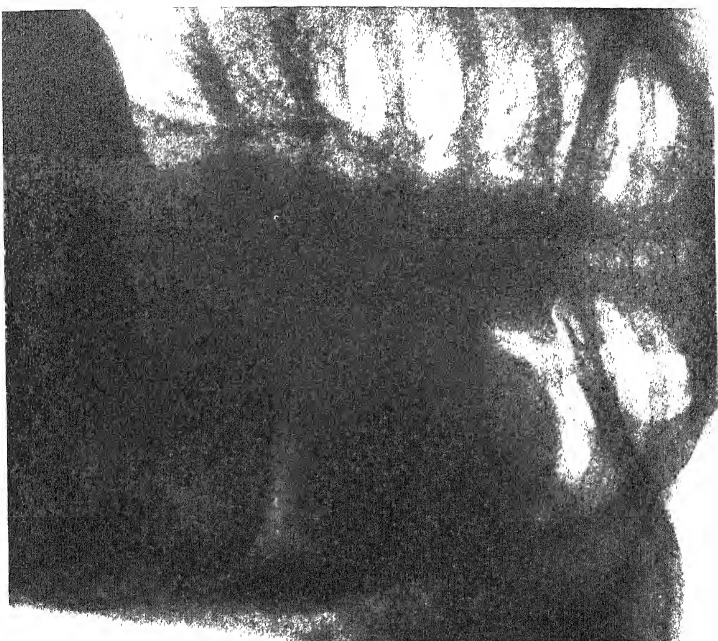


Fig. 1.—Carcinoma, showing paralysis of left half of diaphragm through involvement of phrenic nerve by growth.



Fig. 2.—Same case as *Fig. 1*, after intratracheal injection of Ipioidol, showing blocking of left bronchus.

PLATE XXXII

MEDIASTINAL DERMOID

(M. DAVIDSON)

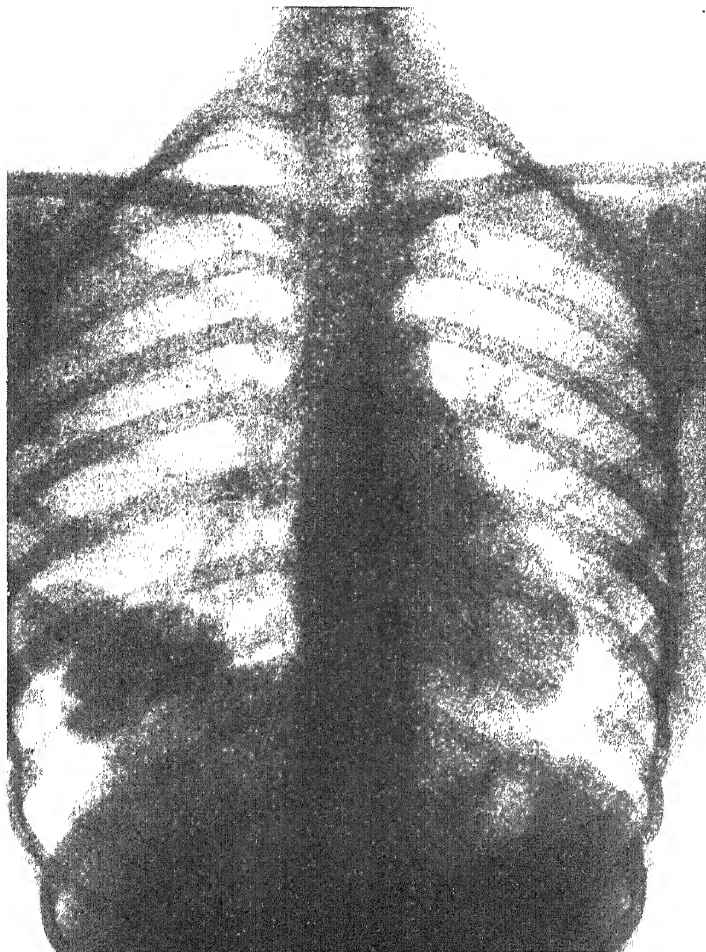


W. F. R. O. S.

PLATE XXXV

DOUBLE HYDATID OF LUNG

(M. DAVIDSON)



Secondary Neoplasms.—

1. In the nodular form the X-ray will reveal multiple large rounded lesions which, as a rule, are more numerous in the lower lobes. They are moderately dense, the margins are sharply defined but may show radiating striae. Comparative absence of changes in the surrounding lung is a characteristic feature.

2. In miliary carcinosis the X-ray will show both lungs studded with small, discrete, clearly defined opacities. Though small they are much larger than those in miliary tuberculosis. The intervening parenchyma shows no change.

Plates XXXI–XXXV are taken by permission of Dr. Maurice Davidson³ from his book, *Cancer of the Lung*, and illustrate some of the above-mentioned features.

TREATMENT.—

Malignant Tumours.—Here the chief hope would be **Early Removal**, but the number of operable growths is at present very small. As a rule a diagnosis is not made until the mediastinal glands are affected. Earlier investigation, more frequent use of bronchoscopy, and early exploration in doubtful examples should provide more cases at a suitable stage. As W. H. C. Romanis⁶ points out, exploration of the chest made between two ribs without taking out bone is not any more serious than an exploration of the abdomen, and much less serious than exploration of the head. It may be found that tumours thought to be malignant are proved on exploration to be benign and capable of removal. A. Tudor Edwards,⁷ in discussing the treatment of intrathoracic tumours, states that with malignant mediastinal tumours only very rarely will operation be possible, and even more rarely will complete freedom from recurrence follow. In one case a primary lymphadenoma of the thymus was removed, and the patient survived the operation and was in fairly good health for several months. Bronchial carcinoma also rarely allows of radical extirpation, owing to its lack of symptoms in the early stage and also to the early involvement of the mediastinal gland. On rare occasions papillomata showing early malignant changes have been successfully removed through the bronchoscope. Localized endotheliomata of the pleura may be removed if diagnosed before secondary deposits occur. Carcinoma of the lung has occasionally been removed by complete or partial lobectomy, but the mortality from such operations is very high.

A. U. Desjardins⁸ shows that there is a specific sensitiveness of cells to **Radiotherapy** and that the lymphocytes are the most sensitive cells of the body. The cells of tumours derived from epithelial or connective-tissue cells are so much more resistant that it is possible by radiotherapy to distinguish between neoplasms arising in lymphoid structures and those derived from epithelium or connective tissue. He describes cases in which the rapid retrogression of the growth pointed to a lymphoid neoplasm. Considerable improvement can therefore be obtained in cases of lymphadenoma, lymphatic leukemia, and lymphosarcoma, although the ultimate prognosis is unfavourable; but in tumours of other origin the improvement in the majority is only slight and fleeting. Tudor Edwards is disappointed with the results of **Deep X-ray Therapy** in mediastinal tumours. Even in cases of lymphadenoma, which often disappears rapidly at first, recurrence is the rule, and the tumour then appears to be insensitive to the rays. He has yet to see improvement in any case of bronchial carcinoma. F. G. Chandler⁹ in 1927 reported an investigation of 120 cases of primary malignant intrathoracic tumours of which half were treated by X rays. In only four were the patients still alive. Three were certainly not cases of malignant disease, and the fourth was a case of lymphosarcoma with large masses in the mediastinum and bilateral pleural effusion. She was treated in 1923 by Finzi with X rays, and four years later

was in perfect health, a skiagram showing a normal chest. Tudor Edwards thinks the insertion of **Radon Seeds** may cause distinct improvement and warrants further trial. W. H. C. Romanis reports a case of a man with a growth in the lung into which, through an exploratory opening, were put thirty radon seeds. The lung remained collapsed and there is still a large hole in the pleura, but the growth has disappeared. A. D. Wright¹⁰ also records a successful case in which an intrathoracic tumour the size of a child's head was treated by the implantation of 100 millicuries of radon in 33 seeds; a month later no signs of growth, radiologically or clinically, could be found.

On the other hand, L. S. T. Burrell¹¹ and F. G. Chandler have had no success with radium treatment. Chandler points out that if we cannot adopt active treatment, we can at least relieve suffering, and that inadequate doses of anodyne are given. He believes that if operation and radiation fail or are not indicated, the first thing to do is to accustom the patient to some form of **Opium**—tincture of opium, nepenthe, heroin, omnopon, etc. This will often overcome the common idiosyncrasies to opium and enable large doses to be taken when they become necessary. The dose then is that necessary to relieve. Relief may also be given by dilute **Hydrocyanic Acid**, **Cocaine**, $\frac{1}{4}$ gr. or more by mouth and by hypodermic injection, **Allonal**, and possibly injections of **Novocain** as a local anæsthetic if the pain is superficial. **Nerve-blocking** might also be tried, but the chief thing is opium.

Benign Tumours.—With regard to benign tumours within the thorax surgical treatment offers considerable success. Intrathoracic goitres should be removed as soon as symptoms interfere with respiration. They can usually be removed through the usual curved cervical incision, but occasionally splitting of the sternum may be required. Dermoids and teratomata are best approached from the side by making a large incision between two ribs; excision of a rib may not be necessary. Hydatid cysts are rare in this country. In Australia surgeons marsupialize the cysts and bring them to the surface. Romanis always attempts to remove the endocyst, and points out that the chief precaution is to prevent any escape of hydatid material into the pleura. The two layers of the pleura must therefore be fixed together before attempting to remove the cyst. Very little in the way of ectocyst occurs in the lung and very little fibrous tissue around the cyst, so that expansion of the lung readily takes place after removal.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, June, 803; ²*Lancet*, 1929, ii, 1181; ³*Amer. Jour. Med. Sci.* 1929, July, 20; ⁴*Jour. of Clin. Research*, 1930, April, 43; ⁵*Cancer of the Lung*: John Wright & Sons Ltd., Bristol; ⁶*Proc. Roy. Soc. Med.* (Surg. Sect.), 1930, 630; ⁷*Ibid.*; ⁸*California and West. Med.* 1930, June, 377; ⁹*Proc. Roy. Soc. Med.* (Surg. Sect.), 1930, 690; ¹⁰*Ibid.* 699; ¹¹*Ibid.* 696.

A. Tudor Edwards, M.Ch., F.R.C.S.

Mediastinal Dermoids.—G. J. Heuer¹ records four cases of mediastinal dermoids operated upon by himself, of which three recovered and one died as a result of operation. In his review of the literature some interesting facts emerge. He finds 138 cases reported, of which 12 were found at autopsy, the diagnosis not having been made during life. In the total, 46 died untreated and 72 had operations for this condition. Of the 72 cases subjected to operation, 1 was treated by simple drainage of the pleural cavity; 34 by incision and drainage of the cyst; 13 by incomplete extirpation; and 24 by complete removal of the tumour. Of the cases treated by incision and drainage, 13 died from several days to several years after operation; 8 who recovered indefinitely were left with persistent sinuses. Only 5 are known to have been completely cured by incision and drainage out of the 34 patients. Incomplete

extirpation resulted in 5 cures out of 13, and usually multiple operations were necessary. Of the 24 patients treated by incompleteness extirpation 3 died and 21 recovered and were cured. Naturally the tendency was to perform radical extirpation in the more favourable cases. The total deaths in the series were 21, in which infection played a predominant part.

C. G. Mixter and S. H. Clifford² record three rare cases of mediastinal cysts in infants. One was operated upon and recovered with two small residual sinuses; the other two died, being unfit for operation. Two of the cysts were of gastrogenic origin, having a similar structure to that of the stomach, and the third bronchogenic, with ciliated epithelium and areas of cartilage. The fluid aspirated was white, viscid, and opalescent.

E. Melchior³ records a somewhat similar cyst to the last, which he terms a 'congenital tracheo-bronchial pulmonary cyst'. This was successfully removed from a girl 8 years of age.

Opening a discussion on intrathoracic tumours before the Royal Society of Medicine, A. Tudor Edwards⁴ groups these tumours under the headings of mediastinal, pulmonary, and pleural, each group being subdivided into malignant and benign types. The mediastinal benign tumours consist of intrathoracic thyroids, dermoids, and teratomata; the malignant varieties—sarcoma, thymic carcinoma, and lymphadenoma. Secondary carcinomatous deposits in glands are by no means uncommon. Careful study of the predominant symptoms and signs, including radiological appearances, is essential before treatment is considered, and where possible operative treatment is advisable. In the benign mediastinal group, operations at an early stage are followed by most satisfactory results. Only rarely will operation be possible in the malignant group, but an account is given of the removal of a lymphadenomatous thymus. **Radium Treatment** is advised for the inoperable malignant cases. In the pulmonary tumours the benign types are rather rare, but fibroma and lipoma of the bronchus have been described, also chondroma and osteoma of the lung. Hydatid cysts are fairly frequently encountered. Carcinoma of the lung appears clinically in two situations—the bronchus or the alveoli, the former being much more common. Bronchial carcinoma can rarely be removed, although one successful case of extirpation is recorded; it should be submitted to radium treatment. Alveolar carcinoma offers definite chances of removal if diagnosed before mediastinal glandular involvement has occurred. When inoperable, **Radon Seeds** should be implanted through an open thoracotomy exposure of the tumour.

Pleural tumours consisting of lipoma, chondroma, fibroma, and ganglioneuroma probably arise in structures which are extrapleural and develop inwards. Early surgical intervention is indicated. The malignant pleural tumours, endothelioma and sarcoma, are only occasionally amenable to operative treatment as they are generally diffuse, and should be given **Radium** or **X-ray Treatment**.

W. H. C. Romanis,⁵ on the same occasion, in discussing hydatid cyst, advises a two-stage operation as for pulmonary abscess, the first stage consisting of the production of adhesions, and at the second stage the endocyst is completely removed. He emphasizes the necessity for early diagnosis for increasing the percentage of operable growths within the thorax.

REFERENCES.—¹*Ann. of Surg.* 1929, Oct., 692; ²*Ibid.* 714; ³*Zentralb. f. Chir.* 1929, Oct. 19, 2626; ⁴*Proc. Roy. Soc. Med.* 1930, March, 689; ⁵*Ibid.*

LUNG, SUPPURATION IN. (See LUNG, ABSCESS OF.)

LUNGS, TUBERCULOSIS OF. (See TUBERCULOSIS, PULMONARY.)

LUPUS ERYTHEMATOSUS. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

TREATMENT.—Observations on the use of injections of **Gold Salts** in this condition continue to be published. A. C. Roxburgh and H. Corsi¹ published the results of treatment in 35 cases by **Krysolgan** or **Sanocrysin**, or in some cases by a combination of both drugs. Of these, 8 cases were cured, but only temporarily; 6 were vastly improved; 9 were definitely improved; 2 were a little improved; 5 were uninfluenced, and 5 were worse. Local treatment was not applied during the course of gold injections. The doses of krysolgan employed were from 0.0015 gr. to 1.5 gr., while with sanocrysin a dose of 0.25 grm. has not been exceeded. Toxic reactions of a mild type occurred in 6 per cent of the injections. The authors conclude that both drugs are of considerable value in the treatment of lupus erythematosus, although neither of them can be regarded as a cure for the disease. Sanocrysin appeared to be slightly more effective, but also slightly more toxic in the doses given, of which the maximum was two and a half times that of krysolgan. Further, the action in those cases in which there was definite evidence of tuberculosis did not appear to differ from that in cases where there was no such evidence. H. Haldin-Davis² speaks favourably of the use of sanocrysin in lupus erythematosus. He uses slightly larger doses than Roxburgh and Corsi—up to 0.5 grm. In a series of some forty cases he had one case of exfoliative dermatitis, which eventually cleared up, and one of severe stomatitis. Of these cases some ten were discharged as cured and remained cured, while all but one showed definite improvement. He advises the administration of **Dextrose** a few hours before giving the drug, and increasing the intervals between the injections to two, three, or even four weeks, once the maximum dose has been reached.

R. M. B. Mackenna,³ following the work of Nicolas, Lacassagne, and Rousset, has treated a number of cases of lupus erythematosus with **Bismuth** and its salts. He publishes details of 14 cases. In 13 of the chronic type, all improved to a greater or less extent, while 4 were discharged as cured; one case of the acute type improved only very slightly. He finds that metallic bismuth and bismuth oxychloride have approximately an equal therapeutic value, while the thioglycollate, although a water-soluble salt, did not give better results than the insoluble preparations. The total dosage of bismuth and the time taken to effect a cure were found to vary in each individual case. He thinks that the best results are obtained by the local application of **Acid Nitrate of Mercury** in conjunction with bismuth therapy.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1930, Aug.-Sept., 382; ²*Brit. Med. Jour.* 1930, i, 432; ³*Lancet*, 1930, i, 178.

LUPUS VULGARIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

TREATMENT.—R. Hallam,¹ at the Annual Meeting of the British Medical Association in Manchester in 1929, made an earnest appeal for early and systematic treatment of cases of lupus vulgaris. He considers that this can only be done by the formation of special institutes for treatment on the lines of the Finsen Institute in Copenhagen. The appeal comes at a time when dermatologists from all over the world have had an opportunity, not only of seeing the work in progress at the Finsen Institute, but also of taking part in a discussion on the treatment of tuberculosis of the skin, in which Dr. Axel Reyn, the Director of the Institute, laid before what was probably the largest gathering of dermatologists ever assembled together, the results of the work carried out at the Institute.² Taking the period of ten years, 1914–23, some 937 cases were treated either by **Local Finsen Treatment** alone or by this combined with general **Arc-light Baths**. Of these, 810 carried out the full treatment, and 735 of them (90.7 per cent) were to all appearances cured.

In considering these results, however, it is necessary to take into account the wonderful equipment of the Finsen Institute, the excellent provision made by the Danish authorities to encourage patients to continue treatment, and not least the vast knowledge and experience which are possessed by the director and staff of the Institute. Only under such ideal conditions as obtained there is it possible to expect such a high percentage of cures; but the efficacy of the treatment is proved by the figures given.

Dietetic Treatment.—Considerable attention has been paid recently, chiefly in Germany, to the effect of diet in tuberculosis. A. Jesionek³ has for some years been employing a **Salt-free Diet**, on the lines suggested originally by Gerson, in his clinic at Giessen with excellent results. The same author has also contributed a paper at the International Dermatological Congress in Copenhagen, on the principles which underlie his treatment.⁴

H. Haldin-Davis⁵ has also described the work of the Giessen Clinic; he states that, though sodium chloride is still absent from the diet prescribed, the essential feature of the régime is rather the fact that all food is uncooked. Jesionek points out that tuberculosis is exclusively a disease of civilized man and domesticated animals. Both men and beasts living in a wild state are free from it, owing to the fact that their skins are able to produce anti-tuberculous fluids in sufficient quantity to destroy at once any tubercle bacilli with which they come in contact. Men and animals living uncivilized and undomesticated existences eat their food raw, and do not take salt with it. Haldin-Davis points out, however, that there are great difficulties in applying this treatment except to in-patients, which limits its use for ordinary clinic treatment in this country.

Local Treatment.—J. Schlammdinger⁶ recommends as a local application in lupus vulgaris a zinc sulphate ointment, known as '**Lupoheal**' (Richter) and composed as follows: Zinc. sulphat. 10, sod. chlorid. pur. 3, aqua destill., adeps lanæ, vaselin. americ., āā 30, anæsthesin 2 parts. The ointment is spread on battiste and bandaged on the lupus patches and left on for forty-eight hours. It is then changed and re-applied as often as required, till the lupus nodules are completely ulcerated out. The preparation is selective for lupus tissue. In spite of the anæsthesin in the ointment, a good deal of pain may be produced, and sedatives may be necessary. When the nodules are completely destroyed, they are allowed to heal under various preparations, such as lotions of **Aluminium Acetate**, **Salicylic-boric Ointment**, etc. The cosmetic results are stated to be good.

REFERENCES.—*Brit. Med. Jour.* 1929, ii, 885; ²*Rapports et Co-rapports, VII^{me} Congrès internat. de Dermatol. et Syph., Copenhagen*, 1930, 201; ³A. Jesionek and L. Bernhardt, *Diätetische Behandlung der Hauttuberkulose und Ernährungsbiologie*, 1930, Leipzig; J. A. Barth; ⁴*Rapports et Co-rapports, VII^{me} Congrès internat. de Dermatol. et Syph., Copenhagen*, 1930, 253; ⁵*Brit. Med. Jour.* 1930, ii, 539; ⁶*Wien. klin. Woch.* 1930, April 24, 530.

LYMPHADENITIS, MESENTERIC. *A. Rendle Short, M.D., F.R.C.S.*

L. Freeman¹ points out that there is a very common condition in children, and more especially in young adults, of chronic non-specific enlargement of the mesenteric lymph-nodes, which are free from micro-organisms and show no evidence of tubercle. The symptoms are pain and tenderness—often colicky pain—intestinal discomfort, often chronic slight rise of temperature and a neurotic temperament. As it does not occur in the second half of life, it is presumably a self-limited disease. The glands are usually too numerous to remove. The treatment is to remove the appendix (if the condition is discovered at operation) and to follow up with open-air life, heliotherapy, cod-liver oil, etc.

H. Auchincloss² discusses calcified lymph-nodes in the mesentery. They show in a skiagram, and may be responsible for chronic invalidism of a vague type, and sometimes acute symptoms like those of appendicitis, renal colic, etc. When they appear to be the cause of severe pain they should be removed. As a rule they show no living tubercle bacilli as tested by guinea-pig inoculation.

REFERENCES.—¹*Ann. of Surg.* 1929, Oct., 618; ²*Ibid.* 1930, March, 401.

LYMPHOGRANULOMATOSIS INGUINALIS. (See CHANCROID.)

LYMPHOMA.

Ivor J. Davies, M.D.

C. W. Baldrige and C. D. Awe¹ (Iowa City) have studied 150 cases of lymphoma. The following terminology was adopted: Lymphoma (lymphoblastoma, malignant lymphoma). (1) Sclerosing type (Hodgkin's disease, lymphogranuloma). (2) Endothelial type (lympho-epithelioma). (3) Lymphoblastic type (lymphosarcoma). (4) Lymphocytic type—(a) With leukaemia (lymphatic leukaemia, lymphocytic leukaemia); (b) Without leukaemia (pseudo-leukaemia, aleukaemic leukaemia). In the foregoing series of 150 consecutive cases of lymphoma the clinical manifestations were protean and were dependent on the involvement of many anatomical structures. The great range of the clinical varieties was a striking feature. It would therefore seem that the prevailing conception regarding the usual manifestation of lymphoma has been taken from the rather brief discussions of the disease appearing in textbooks. Many of the most marked variations in course and clinical manifestations occurred in patients with the same basic pathological change. From this study it would appear that the popular division of lymphatic leukaemia into acute and chronic forms gives an exaggerated idea of the basic differences between the two. As in diabetes mellitus, we may be dealing with a disease that is borne much better by the adult than by the child. A marked clinical variation without corresponding qualitative changes in the basic pathological histology was also seen in the 'acute' and 'chronic' cases of the sclerosing type of lymphoma. Here again the acuity of the disease tended to have an inverse relation to the age. The clinical manifestations of the sclerosing, endothelial, lymphoblastic, and the lymphocytic type without leukaemia may be practically identical. The conditions discussed in this communication may or may not eventually prove to be a variation of the same disease entity. They differ in respect to the condition of the circulating blood, the type of cell predominating in the enlarged lymphoid structures, and to a certain extent in the type of lesion produced in the viscera. In other respects there is a striking similarity. All primarily involve the fixed lymphatic structures and terminate fatally. Fever of an almost specific variety may occur in any type. In all there may be a secondary involvement of skin, bones, nervous tissue, breast, and viscera. The basic metabolic rate is often increased in all types. The histological variation in the various types of lymphoma is no greater than that seen in carcinoma of the stomach.

Lymphoblastoma.—L. K. McCafferty and G. F. Machacek² (New York) believe that Hodgkin's disease, leukaemia, mycosis fungoides, and lymphosarcoma should probably be grouped under the general heading of lymphoblastoma. They submit two case reports which illustrate the difficulty in diagnosis often encountered in this group of affections. The two cases were clinically unlike yet related histologically. While lymphoblastoma is only a tentative classification, it is impossible, in their opinion, to separate the various types clearly until the etiology is known. They believe that clinically it is impossible to make a definite diagnosis, and that even histological examination leaves many vital questions unsolved.

Hodgkin's Disease and its Accompanying Blood Picture.—E. H. Falconer³ (San Francisco) draws the composite blood picture in an analysis of forty cases of Hodgkin's disease. The results conform in a general way to the conclusions drawn by C. H. Bunting,⁴ and substantiate the idea that later in the disease, beyond the first year, the leucocyte count tends to become increased, with an increase in the polymorphonuclear leucocytes. Also there is an average and fairly constant increase in the mononuclear cells. For some reason his platelet-counts are not high, as other authors have found them. This is a matter for further investigation. The eosinophil-count averages about normal or below, but may occasionally be very high, reaching in one instance 80 per cent of the total leucocytes.

REFERENCES.—¹*Arch. of Internal Med.* 1930, Feb., 161; ²*Arch. of Dermatol. and Syph.* 1930, April, 595; ³*California and West. Med.* 1930, Feb., 83; ⁴*Johns Hopkins Hosp. Bull.* 1911, xxii, 369; 1914, xxv, 173.

MADUROMYCOSIS. (See SKIN, FUNGUS INFECTIONS OF.)

MALARIA. (See also BLACKWATER FEVER.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY AND PROPHYLAXIS.—As usual the vast literature of malaria is mainly of local importance, but many points of interest are scattered throughout it. A three years' malarial survey of Jamaica by M. K. Boyd and F. W. Aris¹ shows the disease to be far more prevalent in the coastal lowlands, where it is of great economic importance and difficult to deal with on account of irrigation, and there is a close relationship between high rainfall and increased malaria. *Anopheles albimanus* is a widespread and important carrier, and the prevention of its breeding in many rural districts has proved prohibitively costly; therefore in these the concentration of dwellings on estates at the maximum distance from the breeding-grounds and their mosquito proofing are advocated together with drainage and the use of cheap larvicides, such as Paris green or waste motor oil, and much attention is also being paid to education. G. C. Ramsay^{2,3} writes on malarial incidence and control in Assam. There *A. minimus* is the main carrier, and is practically entirely responsible for the spread of malaria, as shown by 27,000 dissections, so it is essential to control its increase continuously from the middle of April to almost the end of the year, during which period it can become infected; good results have followed such continued measures on some tea estates. This carrier migrates during the rainy season to higher ground to lay her eggs above flood-level, and this complicates prophylaxis. Scientific drainage with sub-soil pipes is of value. An interesting historical review of malarial incidence in Australia by R. W. Clinto and A. H. Baldwin⁴ shows that the disease is only prevalent in the northern territories, including parts of Queensland, although the *A. annulipes* carrier is much more widespread, and they think that the economic and hygienic status of the people protects them from infection. P. C. C. Garnum⁵ reports at length on malaria in Kisumu, Kenya Colony, where there is a high incidence of malignant tertian malaria throughout the year, accentuated after prolonged rains and dependent on the sudden appearance of *A. gambiae*, although *A. funestus* is the probable transmitter of the endemic malaria. L. d'A. de la Salle⁶ reports on the struggle against malaria at Casablanca, Morocco, by means of the drainage of marshes, stocking collections of water with larva-devouring fish, and extensive distribution of quinine as a preventive and curative measure; these precautions have caused malaria nearly to disappear, with a considerable fall in its mortality.

The prophylaxis of malaria in Indian cantonments is discussed by R. A. Mansell,⁷ who gives a diagram to show a steady fall in the disease among British

troops in India from 1924-8, although he warns against a possible increase in an unhealthy year due to climatic conditions; he lays special stress on the use of **Paris Green** as a larvicide. J. H. C. Walker⁸ records an interesting illustrated historical survey of the well-known prophylactic measures in Malaya, where early mistakes were rectified, and—with the aid of ample funds, such as \$183,971 on new work and \$59,230 on maintenance at Kuala Lumpur alone—a considerable degree of success has been achieved, largely through the construction of subsoil drains on an extensive scale, under expert committees to ensure continuity of supervision. M. Watson⁹ also deals with the same subject once more. W. E. Deeks¹⁰ reports on the progress of malarial control on the United Fruit Company's estates in tropical America, and he urges waging war against all *Anopheles* within flight of habitations by short-radius sanitation and an endeavour to cure all human carriers; for the latter purpose he advises the use of **Plasmochine** to destroy the gametocytes, in addition to quinine. R. Knowles¹¹ records a study of a vast amount of unpublished reports on malarial investigations in India, a bibliography of which by J. A. Sinton will be published soon by the Indian Research Fund Association, when a widely prevalent view that "malaria has been little studied in India" since the discoveries of Sir Ronald Ross, based on the comparatively small amount of such work—only 15 per cent—published in medical journals, will be shown to be entirely erroneous, for 15 per cent appeared in little-read local government reports and 70 per cent are still unprinted. After a review of a few such papers he concludes that: "It is nonsense to say that India is not grappling with her immense problem of malaria—the most important of all public health problems in this country; the truth probably is that there is more investigation of malaria going on in this country [India] than in any other in the world, *when the funds available are considered*." The same worker¹² relates a brief tour of India with the Malarial Commission of the League of Nations; this also illustrates the immensity of the malarial problem and the steps being taken to grapple with it. B. C. Basu¹³ describes the breeding-places of *A. stephensi* in Calcutta, and shows a close relationship between the curves of the rainfall, the *A. stephensi*, and the malarial incidence. M. Jacob and K. S. Shah¹⁴ report on the use of **Paris Green** as a larvicide in the Punjab in a 1 per cent dilution, 1 grm. of which suffices for ten square yards of water surface at a cost for the preparation alone of 3½d. per 1000 sq. yards per application, which should be repeated every sixth day.

R. M. Gordon and G. Macdonald¹⁵ report experimental work on the anopheline carriers of malaria in Sierra Leone, which showed *A. gambiae* to be the most important transmitter of the disease as an easily infected domestic mosquito; *A. smithii* may play a small part, as it can be infected and has been found in native houses, but *A. rhodesiensis* is not easily infected or induced to feed on man, so it is of little importance. C. G. Huff¹⁶ has investigated the influence of selection on susceptibility to bird malaria in *Culex pipiens*, and he concluded that there is strong evidence of the existence of susceptible and non-susceptible members in this species. B. Mayne¹⁷ has studied the influence of relative humidity on the life and infectivity of the mosquito, and has confirmed and extended the finding of Gill to the effect that when the humidity falls below the critical figure of 48 per cent relative humidity at a temperature of 27° C., the infected mosquitoes do not survive long enough to transmit malarial infection, for the present worker found that with *C. fatigans* and bird malaria the minimum humidity which allowed of the viability of the imbibed malarial organism was 44 to 46 per cent at temperatures of 72° and 80° F.

C. Strickland and K. L. Chowdhury¹⁸ report on two forms of traps for adult mosquitoes made respectively of a tea-plucking basket or of a tea-box with a central opening six inches in diameter in the lid, the former being heaped inside with cow-dung and the latter blackened inside with stencil ink. Two years' trial showed that the tea-box form caught 12 per cent more insects than the tea-basket. C. Dover¹⁹ advises the following method of using **Citronella Oil** to keep off mosquitoes, which, on account of its low volatility, is effective for a whole night in very small amounts. Citronella oil (Burgoyne's) $\frac{1}{2}$ oz., spirits of camphor $\frac{1}{4}$ oz., cedar-wood oil $\frac{1}{4}$ oz., and white petroleum jelly (B.P.) 2 oz. Its application to the hair is said to keep away mosquitoes from the face.

CLINICAL.—R. Knowles and B. M. Das Gupta²⁰ report a study of an artificially induced attack of quartan fever of a severe type. The temperature curve was rather irregular at first, but became more typical later. Quantitative estimations showed that some 95 per cent of the merozoites are destroyed in each cycle, probably by lysins in the plasma, in untreated cases. The merozoite stage lasts about one hour, the ring stage for seventeen hours, the growing trophozoite stage seventeen, that of schizogony six, and the rosettes one hour, while the gametocytes do not live much more than six days. A course of 200 gr. of quinine appeared to eradicate the infection completely.

T. A. Hughes and D. L. Shrivastava²¹ report the fact that subcutaneous injections of 1 c.c. of 1-1000 adrenalin and intravenous injections of 6 gr. of quinine hydrochloride in 10 c.c. saline in chronic malaria patients with enlarged spleens both produced an increase of the total blood leucocytes and of the monocytes. J. A. Sinton and H. W. Mulligan²² report on staining malarial parasites by the iron-haematoxylin method, and give full details of the procedure they found to be best. H. Goldie²³ discusses the literature of malarial nephritis, which is most common in the toxic subtertian form and in neglected chronic quartans, in the form of the hydraemic type, which rapidly yields to specific malarial treatment. R. B. Lloyd and S. N. Paul²⁴ report graphs illustrating the variations in the amount of proteins in the blood during the course of malarial fevers, and they found them to present similar characters to those they obtained in typhoid—namely, a marked reduction in the serum-albumin with a rise of the euglobulin, together with unchanged or slightly reduced total globulin, and these typical changes disappear rapidly after the use of quinine. These blood-protein changes are totally different from those of kala-azar, so they are of diagnostic importance between these easily confused fevers. R. Green²⁵ reports an investigation of the time of excretion in the urine of quinine salts and of plasmochine, using Mayer's reagent for the former and the chloranil test for the latter. Quinine began to be excreted in small amounts after two hours, reached its maximum in from three to nine hours, and ceased to be demonstrable after nine to thirteen hours; the hydrochloride was excreted most rapidly. The test for plasmochine is not sufficiently delicate to give full information, but the drug could be found in the twenty-four hours' secretion after a dose of 0.003 grm.

TREATMENT.—It is now very generally held that **Plasmochine** should only be used in conjunction with **Quinine** in cases under close medical control with a view to destroying the mosquito-infecting sexual stage of the parasites, to lessen the infectivity of the patients, and to diminish the tendency to relapses. Thus J. A. Sinton, S. Smith, and D. Pottinger²⁶ hold that the new drug should only be used under the constant supervision and control of the medical profession on account of its dangerous toxicity; but in combination with not less than 20 gr. of quinine daily it is better than the latter alone for

producing permanent cures of benign tertian malaria. The dose of plasmochine should not exceed 0.03 to 0.04 grm. daily, and a more prolonged course of small doses is preferable to larger doses over a shorter period, and the drug must be stopped on the least suspicion of toxic symptoms. J. A. Sinton²⁶ also reports a trial of **Parosan** and of **Dimeplasmin** in malaria, but the cases were too few to allow him to say more than that the former may prove of value in combination with quinine. A. G. Biggam and M. A. Arafat²⁷ report on the use of **Plasmochine Co.** (containing quinine) on subtertian malaria induced by blood injections in heroin addicts in Egypt, in whom he had frequently observed a malarial form of dysentery yielding to anti-malarial treatment, which he describes. He concludes that the combination is better than quinine alone in the rapidity of clinical cure and in the disappearance of the sexual stage of the parasites from the blood. He also used plasmochine intravenously without observing toxic symptoms, but does not think this method has any advantages. F. de Mello²⁸ has confirmed the general opinion on the value of plasmochine. S. Smith²⁹ agrees that plasmochine, 0.4 grm. daily under expert supervision, with quinine is the most rapid and lasting cure of benign tertian malaria. R. Ullmann-Apostolon and G. Apostolon³⁰ advise in chronic malaria daily intravenous injections of $\frac{1}{2}$ to 1 gr. of **Cacodylate of Soda** together with **Sulphate of Strychnine**.

Quinine is advised by D. Reynolds³¹ to be given two hours before the expected malarial paroxysm, and repeated twice at intervals of four hours in 15-gr. doses of the hydrochloride, with a view to exerting its maximum incidence on the recently divided young ring stage of the parasites. A. J. Orenstein³² discusses whether the widespread distribution of quinine in backward malarial parts of South Africa is likely to reduce the incidence of the disease, and, after pointing out that the drug is of curative rather than of prophylactic value, concludes against such wholesale and costly quinization of the people, but advises expert investigation with a view to attack on the incriminated anopheline carriers alone. R. N. Chopra and S. G. Choudhury³³ hold that the enhanced activity of cinchona alkaloids on the alkaline side may be partly attributed to lowering of surface tension.

REFERENCES.—¹*Amer. Jour. Trop. Dis.* 1929, Sept., 309; ²*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, March, 511; ³*Lancet*, 1929, ii, 1356; ⁴*Med. Jour. of Australia*, 1930, March 1, 274; ⁵*Jour. Trop. Med. and Hygiene*, 1929, Aug., 1, 207, 221; ⁶*Presse méd.* 1930, Jan. 1, 1; ⁷*Jour. R.A.M.C.* 1929, Sept., 196; ⁸*Ibid.* 1930, Feb., 87; ⁹*Jour. Trop. Med. and Hygiene*, 1929, Dec. 2, 337; ¹⁰*Ibid.* 1930, April 15, 101; ¹¹*Ind. Med. Gaz.* 1929, Oct., 573; ¹²*Ibid.* 1930, Jan., 23; ¹³*Ibid.* April, 191; ¹⁴*Ibid.* Feb., 84; ¹⁵*Ann. of Trop. Med. and Parasitol.* 1930, April, 69; ¹⁶*Ibid.* 1929, Dec., 427; ¹⁷*Ind. Jour. Med. Research*, 1930, April, 1119; ¹⁸*Ibid.* 1009; ¹⁹*Ibid.* Jan., 961; ²⁰*Ind. Med. Gaz.* 1930, June, 301; ²¹*Ind. Jour. Med. Research*, 1930, Jan., 651, 657; ²²*Ibid.* April, 1329; ²³*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, March, 503; ²⁴*Ind. Jour. Med. Research*, 1930, April, 583; ²⁵*Ind. Med. Gaz.* 1930, Nov., 614; ²⁶*Ind. Jour. Med. Research*, 1930, Jan., 793; ²⁷*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, April, 591; ²⁸*Presse méd.* 1929, Sept. 18, 1215; ²⁹*Jour. R.A.M.C.* 1929, Aug., 81; ³⁰*Presse méd.* 1929, Aug. 31, 1137; ³¹*Jour. R.A.M.C.* 1930, April, 206; ³²*Jour. Med. Assoc. S. Africa*, 1929, Sept. 14, 479; ³³*Ind. Jour. Med. Research*, 1929, Oct., 360.

MALTA FEVER. (See UNDULANT FEVER.)

MANIC-DEPRESSIVE PSYCHOSES. (See MENTAL DEPRESSION, TYPES OF.)

MASSIVE COLLAPSE OF LUNG. (See LUNG, MASSIVE COLLAPSE OF; PRE- AND POST-OPERATIVE TREATMENT.)

MASTOIDITIS. (See EAR, DISEASES OF.)

MEASLES.*J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—H. Gebhardt¹ describes an epidemic of measles which broke out at Prenzlau in December, 1929, in a camp of Germano-Russian refugees who had come from Moscow, and lasted until the end of the following January. The epidemic was remarkable for the high mortality—49 deaths among 208 cases (23·7 per cent)—and the frequency of complications, which were attributed to mental and physical strain, malnutrition, rickets, and Barlow's disease.

SYMPTOMS AND COMPLICATIONS.—Cases of *measles contracted late in life* are reported by H. J. Hall² and R. B. Graham.³ Hall's patient was a man of 57 and Graham's a woman of 72. Both made an uncomplicated recovery. The oldest measles patient whom the reviewer has seen in the course of thirty years' fever practice was a lady of 52, recently under his care, who had a mild and uncomplicated attack.

A. F. Canelli⁴ maintains that *Debré's phenomenon*, i.e., absence of measles rash at the site of injection of convalescent measles serum which has not prevented the appearance of the eruption, is a phenomenon of inhibition, whereas the Schultz-Charlton reaction is one of extinction, as Debré's phenomenon does not appear when convalescent measles serum is given at the beginning of the eruption stage. At the end of the catarrhal stage, therefore, there is a local immunity of the skin produced by specific substances which are unable to produce a general immunity.

J. L. Kohn and H. Koiransky⁵ took successive skiagrams of the chest in 180 cases of measles in children of from 7 months to 12 years, and found *pneumonic infiltrations* before, during, or after the eruptive stage in 64 per cent of the children under 4 years of age and in 42·2 per cent of those of 4 years and over. The most frequent site of infiltration was the right lower lobe, and then in order of frequency the right upper, left lower, and right upper and right middle lobe. Of the cases in which the infiltrations were seen 79·2 per cent were clinically mild.

J. Caminis⁶ reports seven cases of *acute adenoiditis* which occurred during an epidemic of measles. Rapid recovery followed instillations of **Gomenol Oil** into the nasopharynx. The complication, which occurred in children suffering from adenoids, developed either at the height of the disease or in convalescence.

R. Hürthle⁷ records a remarkable *remission in disseminated sclerosis* in a man, age 49, following an attack of measles complicated by pneumonia, though recovery was not complete. Hürthle regards the improvement as the consequence of the attack of measles and not merely a coincidence, on the analogy of the improvement in general paralysis as the result of malaria therapy.

G. Costantino⁸ reports three cases of infants, aged from 4 to 5 months, the subjects of facial eczema, in whom an intercurrent attack of measles was followed by a rapid and permanent *disappearance of eczema*. He attributes the curative action of measles to changes in the systemic and cutaneous neurochemistry produced by the acute exanthem. Injections of measles convalescent serum, on the other hand, did not have any effect.

In a paper on *tuberculosis and measles* P. Nobécourt, R. Liège, and A. Herr⁹ state that of 459 cases of measles admitted to the Hôpital des Enfants Malades, Paris, in the first six months of 1929, 33 (7·18 per cent) gave a positive cuti-reaction during the course of the disease, though only 4 of them had definite evidence of tuberculosis before admission. The subsequent history of the remaining 29, none of whom had shown any signs of tuberculosis before their attack of measles, was as follows. In 10 measles pursued a normal course, 3 died of the ordinary complications of measles, and 5 of acute pulmonary

tuberculosis. Seven, of whom 2 died, developed subacute pulmonary tuberculosis, 2 had peritonitis in convalescence, and 2 meningitis. The writers conclude that while tuberculosis has no definite influence on the course of measles, measles has an unfavourable effect on some, though not all, cases of tuberculosis. Measles may give rise to acute and fatal pulmonary tuberculosis in children who appeared to be in good health before their attack of measles. It is also possible that the ordinary bronchopneumonia of measles has a predilection for tuberculous children, in whom it is usually fatal. On the other hand, tuberculosis is not a very frequent sequel of measles, as only 15 (3.48 per cent) of the 459 cases developed definite tuberculosis. Moreover, only 62 per cent of cases of tuberculous meningitis gave a history of a recent attack of measles (*see also* MEDICAL ANNUAL, 1927, p. 290).

Y. Robert¹⁰ reports 13 cases of various forms of *tuberculosis of the skin* following measles in patients aged from 4 to 37 years. The most frequent forms were lupus vulgaris and verrucose tuberculosis, while the rare varieties were lichen scrofulosorum, tuberculous gummata, and papulonecrotic tuberculides. The temporary anergy which is shown by disappearance of the cuti-reaction in measles accounts for the development of cutaneous tuberculosis. The inflammatory condition of the skin in measles is probably a predisposing cause of the cutaneous localization of the tubercle bacilli.

PROPHYLAXIS.—In view of the difficulty in obtaining serum from measles convalescents, various substitutes have been used with satisfactory results—for example, the whole blood of adults who have had measles from two to twenty-five years previously (G. B. Bader¹¹); the pooled Wassermann-negative serum of the parents (A. E. Siegel and H. Ermann¹²); and anti-measles Tunnicliff's diplococcus goat or horse serum (J. D. van Cleve,¹³ M. G. Peterman¹⁴).

A. Lichtenstein¹⁵ has found that the ordinary doses of convalescent measles serum (2 to 3 c.c.), which are sufficient to protect healthy children, completely failed to immunize patients suffering from scarlet fever or diphtheria. In the case of scarlet fever five to ten times the ordinary dose, or 15 to 30 c.c., were required, and in diphtheria the amount had to be three to six times the ordinary doses, or 7.5 to 15 c.c.

REFERENCES.—¹*Med. Klin.* 1930, 548; ²*Brit. Med. Jour.* 1930, i, 586; ³*Ibid.* 676; ⁴*Bull. Sez. ital. Soc. internaz. di Microbiol.* 1929, 173; ⁵*Amer. Jour. Dis. Child.* 1929, xxxviii, 258; ⁶*Arch. Méd. Enf.* 1930, 231; ⁷*Deut. med. Woch.* 1929, 1928; ⁸*Clínica Pediátrica*, 1930, 216; ⁹*Arch. Méd. Enf.* 1930, 65; ¹⁰*Thèse de Paris*, 1930, No. 66; ¹¹*Jour. Amer. Med. Assoc.* 1929, xciii, 668; ¹²*Amer. Jour. Med. Sci.* 1930, clxxix, 192; ¹³*Arch. of Pediatrics*, 1930, 124; ¹⁴*Amer. Jour. Dis. Child.* 1930, xxxix, 294; ¹⁵*Acta Paediatrica*, 1929, ix, 77.

MEDIASTINAL TUMOURS. (*See* LUNG AND MEDIASTINUM, TUMOURS OF.)

MÉNIÈRE'S SYNDROME. (*See* EAR, DISEASES OF.)

MENINGITIS, CEREBROSPINAL. (*See* CEREBROSPINAL FEVER.)

MENTAL DEFICIENCY. (*See also* EUGENIC STERILIZATION.)

Henry Devine, M.D., F.R.C.P.

Mental Deficiency in School-children.—T. Ferguson¹ has carried out a particularly valuable study in which he records the results obtained by dealing with the problem of mental inefficiency in school-children by the organization of special schools and backward classes. *Table I* summarizes the results of ascertainment of mentally defective and mentally unstable children in a school population of 12,184.

In *Table II* it will be observed that, of 308 children examined, 30 showed indications of gross mental instability. These indications ranged from definitely criminal tendencies to repeated outbursts of violent temper, and were not confined to children of any particular mental level.

The importance of recognizing these unstable types is obvious, for they are types of personality which may develop into delinquents, and early diagnosis and psychological treatment may make the prognosis much more favourable

TABLE I.

| AREA OF INVESTIGATION | CHILDREN ON ROLL | FEEBLE- MINDED | IMBECILE | MENTALLY UNSTABLE |
|---|---------------------|-------------------|----------|----------------------|
| County area | 6,075 | 57 | 13 | 16 |
| County borough | 6,109 | 62 | 6 | 13 |
| Total | 12,184 | 119 | 19 | 29 |
| Defectives found per 1000 on roll of attendance | | 9.8 | 1.6 | 2.4 |

TABLE II.

| INTELLIGENCE GRADING | NUMBER OF CHILDREN EXAMINED | NUMBER SHOWING MENTAL INSTABILITY |
|---------------------------|--------------------------------|--------------------------------------|
| Of normal intelligence .. | 12 | 2 |
| Dull or backward | 140 | 13 |
| Feeble-minded | 131 | 10 |
| Imbecile | 25 | 5 |
| Total | 308 | 30 |

TABLE III.

| | MALES | FEMALES | TOTAL |
|--|-------|---------|-------|
| No reliable information obtainable | 23 | 15 | 38 |
| Certified ineducable after short probationary period | 3 | 5 | 8 |
| Number in institutions | 12 | 11 | 23 |
| At home, unable to work | 7 | 7 | 14 |
| Assisting at home | 4 | 11 | 15 |
| Partially employed—casual work | 10 | 1 | 11 |
| Fully employed | 25 | 8 | 33 |
| Total number of children who have left school .. | 84 | 58 | 142 |
| Known to have passed through police hands .. | 4 | 2 | 6 |

than it would otherwise be. These children exhibited many types and degrees of abnormality, but they had one thing in common—a considerable prospect, in the absence of scientific treatment during school life, of developing into bad citizens.

A useful feature of this investigation is the care devoted to the case-histories after leaving school. *Table III* is a summary of after-histories of all children leaving the special school, 1903-28.

In order to obtain results permitting of more accurate analysis a list was prepared including only children who (1) attended the school for at least two years, and (2) have left school for a further period of at least five years. In this narrower basis it was found possible to trace the after-histories of 70 children. From the economic standpoint these histories are summarized as shown in *Table IV*.

TABLE IV.

| | ECONOMIC FAILURES | | PARTIAL SUCCESSES | | SUCCESSSES |
|---------------------------------------|-------------------|------------------------|-------------------|-------------|-----------------|
| | In Institutions | At Home Unable to Work | Assist at Home | Casual Work | Full Employment |
| Males (48) | 5 | 11 | 2 | 10 | 20 |
| Females (22) | 4 | 2 | 8 | 0 | 8* |
| Total (70) | 9 | 13 | 10 | 10 | 28 |
| Percentage of children examined | 12.8 | 18.6 | 14.3 | 14.3 | 40.0 |
| | 31.4 | | 28.6 | | |

* Including 2 girls working as 'day girls'.

Ferguson points out that the subsequent degree of economic success of ex-special-school children is a matter of great importance. The future of these children hangs in the balance; they have rarely that margin of safety which may enable a bright child to battle successfully with adversity. It follows that they require all the assistance they can get, and this can best be afforded by an energetic Voluntary Care Committee in association with the school. With these children, perhaps even more than in an ordinary elementary school, the development of character is of fundamental importance—not merely the development of an orthodox code of public morality, the need for which is obvious, but the creation of a spirit of confidence and self-reliance.

Interesting facts are also given in regard to the children in backward classes in ordinary elementary schools. Of the children so treated, 50 per cent were sufficiently improved to be able to assume their normal places in the school, the chief factors influencing the measure of success being the early institution of treatment, longer persistence in the treatment, and careful regulation of the size of the classes. The cause of the retardation in about 40 per cent of 'backward-class' children was inherent dullness; in the great majority of the remainder the condition was due to physical defect or was the result of previous illness.

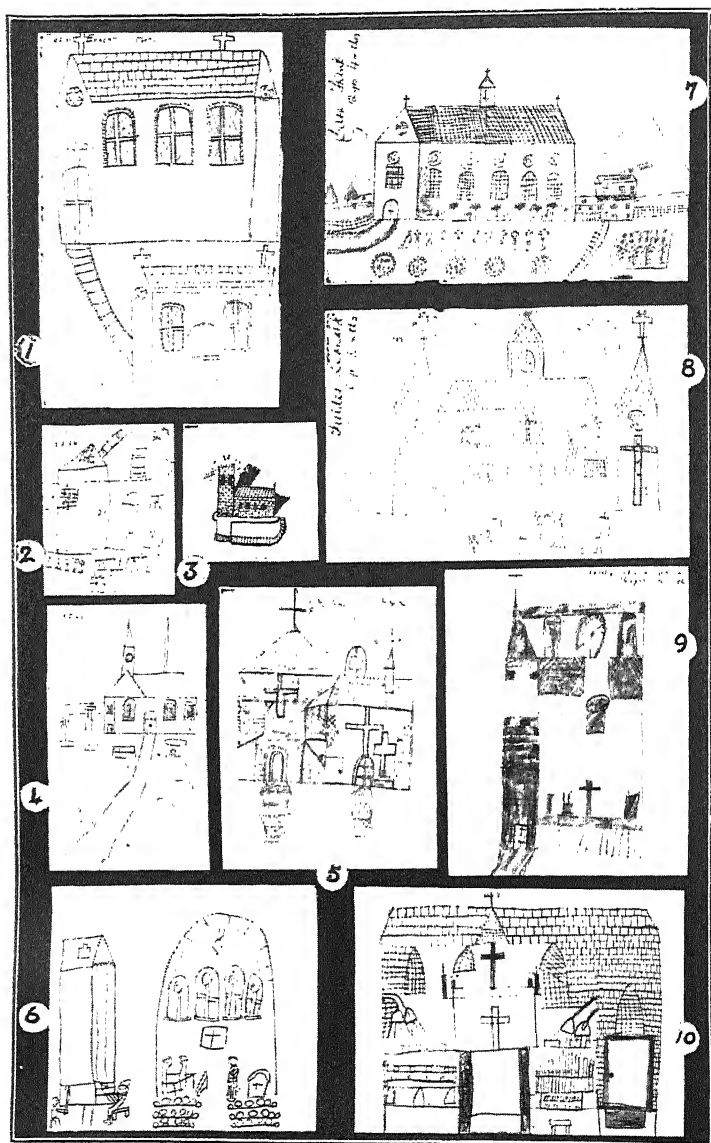
In a contribution on the *mental development of feeble-minded children* R. G. Gordon and R. S. Thomas² give some figures of the after-history of 86 children who were educated in the special school for defectives in Bath. The children were discharged from the school as follows: 27 per cent were passed to the statutory mental deficiency committee as imbeciles—that is to say, they proved unable to fend for themselves in life; 36 per cent were classified as low-grade feeble-minded, probably unable to fend for themselves; and 37 per cent were considered able to fend for themselves and not notified to the statutory committee. Actual results up to the end of 1925 are known as regards 52 children, of whom 42 per cent are at work fending for themselves, 25 per cent are at home incapable of work, 10 per cent are out of work failing to fend for themselves, and 23 per cent are in institutions.



PLATE XXXVI

ÆSTHETICS AND MENTAL DEFICIENCY

(F. B. SHERLOCK)



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The writers find from their investigations that, contrary to the common supposition that mental defectives stop short in their development, on the whole they definitely, though slowly, advance in mental age right on to fifteen years and over, thus showing progress for fully as long a period as the normal. Such progress, however, depends largely, as in the normal person, upon the necessary stimuli being supplied, and it is reasonable to suppose, as the writers observe, that such stimuli can be supplied and interest aroused to better advantage when they are put to tasks within their capacity than when they are subjected to the unfair competition of the ordinary school.

Criminal Lunatics and the Crime of Arson.—An interesting sidelight on the relationship between feeble-mindedness and a senseless form of delinquency is afforded by an article by Thomas Christie³ on this subject. The writer has made a study of the last hundred 'arsons' in sequence admitted to Broadmoor Asylum. He has personally come in contact with 31, and his observations are chiefly made on these. The information concerning the remaining 69 is gleaned from the notes of his predecessors. In these 100 cases one feature is outstanding, and that is the lack of education. Forty-four were mentally defective and could not be educated; 50 lacked the power of application and were so retarded that their educational attainments were limited; and the remainder, supposed to be of brighter intellect, were more of the verbalist type, garrulous no doubt, and considered by some to be good conversationalists. On the surface they were good, but none really had any depth of education. It would appear proverbial that "once a stackfirer, always a stackfirer", and all with repeated offences of arson showed remarkable consistency in their methods. With one exception, those who had been previously convicted set fire to haystacks and used the same method of incendiarism. The one exception he actually set fire to a barn his first time. On release he not only committed a like offence, but actually set fire to the same barn. These are signs of the ineducable, the dull, and the backward—their minds running in one groove, with no foresight, ability to plan, initiative, or originality. Of the 65 cases of stackfiring, 36 (55 per cent) of the culprits were definitely certifiable as mentally defective, while all but half a dozen of the remainder were of the backward type. They are of the more notable types of unemployed, or, more correctly, unemployable, who, owing to repeated refusals of work, or dismissal after brief trial, think the world 'up against them', believe they are unwanted, and develop resentment and the sense of persecution with which their inferior minds and morals cannot cope. Usually they degenerate into definite delusional insanity, culminating in some purposeless act, such as stackfiring.

Esthetics and Mental Deficiency.—E. B. Sherlock⁴ is responsible for an interesting investigation on this subject. From a consideration of the results of this inquiry into the æsthetic aspects of mental processes it is concluded: (1) That as regards modes of artistic expression there is no difference, except in degree, between normal persons and those who are mentally defective; and (2) That while individual mentally defective persons may show a considerable amount of talent in particular fields, they do not, even in these, reach the levels attained by those of normal mentality. As to the practical bearing of the inquiry, the writer suggests that the evidence obtained as to the extent to which æsthetic sensibility is present in the mentally defective raises the question whether the possibilities of contribution to happiness which a cultivation of that sensibility may open out are yet fully realized.

The experimental work included the field of pictorial representation, the children being asked to draw a church without previous warning. A selection of the drawings is shown in *Plate XXXVI*. For purposes of comparison Nos. 2 and 4, which are drawings made by a normal child at six years and at nine

years of age, have been added. This child shows no special aptitude for drawing, but No. 4 indicates the existence of some notion of perspective, e.g., in the delineation of the path. In No. 2 the chimney is askew because the drawing had got near the top of the paper. Both Nos. 2 and 3 show the attempt to indicate the association of music with the idea of a church by introducing some elements of musical notation. No. 6 is a purely interior view showing the principal features, including the organ-blower. No. 10 is a rather complex scheme of interior and exterior features combined in one picture. There is little idea of perspective in the drawings. The fact that both ends or sides of a building would not be visible at the same time from the standpoint selected is ignored. About some of the drawings there are characteristics which recall the work of mediæval artists; in some are found what appear to be indications of the genesis of impressionism.

Mongolian Idiocy: the Manner of its Inheritance.—Madge T. Macklin⁵ contributes a lengthy article on this problem. The bibliography contains 163 references. The subject is discussed under the following headings: Theories of etiology; Mongolian idiocy in twins; importance of the 'short little finger'; method of inheritance of Mongolian idiocy; and the writer's own experimental studies. From a survey of the literature Macklin finds no adequate support for the contentions that syphilis, mental or physical suffering of the mother during pregnancy, advanced age of the mother at the time of conception, reproductive exhaustion due to a large number of pregnancies, or the father's being younger or much older than the mother, have any etiologic significance in the production of Mongolism. Evidence is presented that these and all other environmental influences that may be mentioned are not the cause of Mongolian idiocy, but that it is due to inherited defects, and so is germinal in origin. She also finds no support for the statement that it is due to the presence of one pair of unit recessive factors. The author believes its mode of inheritance is much more complex, and gives figures showing the similarity between theoretical and practical results when the theoretical are based upon the assumption that the disease is due to the simultaneous presence in the germ-cell of five recessive factors or two dominant and four pairs of recessive factors, carried in as many different chromosomes. It is not suggested, however, that such agreement constitutes proof that this is the mode of inheritance of Mongolian idiocy.

REFERENCES.—¹*Edin. Med. Jour.* 1929, Sept., 526; ²*Brit. Med. Jour.* 1930, i, 1123; ³*Ibid.* 162; ⁴*Metropolitan Asylums Board Annual Report*, 1928-9, 334; ⁵*Amer. Jour. Med. Sci.* 1929, Sept., 315.

MENTAL DEPRESSION, TYPES OF. *Henry Devine, M.D., F.R.C.P.*

Sir Farquhar Buzzard¹ writes a useful clinical article dealing with the types of depression which are apt to be vaguely termed 'neurasthenia'. He emphasizes particularly the desirability of differentiating between those depressive reactions which are responsive to psychotherapy and those which are not. He states that out of any 100 patients sent or brought to him suffering from depression, insomnia, loss of concentration, and fatigability, 99 are labelled 'neurosis', and perhaps one a possible 'manic-depressive psychosis'. After investigation the proportion is probably fifty-fifty. Two main groups have to be distinguished in dealing with cases with the symptoms described above, namely: (1) The manic-depressive group in which the depression is primary, autonomous, or endogenous; and (2) The anxiety states, in which the symptoms are reactive or exogenous.

The differential diagnosis in these cases is important from the points of view of treatment and prognosis. In the anxiety neurosis the depression is variable and can be favourably influenced by environment. The illness can be traced

to external factors, though the real anxieties and fears at the bottom of the condition are often difficult to elicit, and may only be reached after much probing and after a state of confidence has been established between the patient and the doctor. In the manic-depressive group, the depression, often described as a cloud, varies but little and is not influenced by external factors. The patient has no belief in the possibility of recovery. Although the onset of the illness may follow a period of overwork or anxiety, such possible exciting causes are frequently absent, and the disappearance of the stress has no effect on the course of the illness.

In both the reactive and autonomous depressions the prognosis is generally favourable provided that the treatment of the patient is wisely and skilfully conducted. The treatment in the two reaction types differs, however, since the reactive depressions are responsive to psychotherapy, and the endogenous depressions are not amenable to technical methods of psychological treatment; there is a risk, indeed, that they may be harmful. These patients are liable to exhibit suicidal impulses to a much greater extent than those suffering from reactive depressions. The treatment in the manic-depressive psychosis must be largely symptomatic—sedatives for insomnia, the avoidance of fatigue, and light occupation for those who are not too agitated and restless. The depression tends to lift in course of time, though a recurrence sooner or later is probable.

R. D. Gillespie² has made a study of the clinical differentiation of different types of depression. In a series of twenty-five cases it was found possible to group them, as above, into 'reactive' and 'autonomous' types of reaction. A third group, really a subdivision of the autonomous variety, is the 'involuntional'. The central feature of the emotional state in the reactive depression is its responsiveness to both external and internal (conscious) influences. This responsiveness, by virtue of which the group is termed 'reactive', was exhibited in relation to a variety of factors: (1) The apparently precipitating cause of an external nature—a relationship which is more or less appreciated by the patient. (2) Changes in the environment during the course of the illness—for example, entry into the hospital, changes in the personnel of the environment, visits of relatives or visits home, the receipt of bad news, changes in the weather, economic stress. (3) Changes in the 'internal environment', rumination of a pessimistic, self-deprecatory, or anxious kind; altered coenesthesia from bodily discomfort—for example, after a sleepless night. (4) Psychotherapeutic treatment—persuasion and explanation. In the autonomous cases external events exerted but little influence, although spontaneous variations in the depth of the depression were frequent.

In the cases studied the prognosis for actual recovery has (so far) been much better in the reactive group than in the autonomous, and in the autonomous than in the hypochondriacal. The duration has been briefer in the first group than in the second. The only group which proved accessible psychotherapeutically to any notable degree has been the first. Gillespie points out that no one sign, be it insight, type of thinking difficulty, reactivity, mood variation, projection, physical signs, physique, or heredity, is going to serve as a touchstone for diagnosis, or prognosis, or as a therapeutic indication. But of all the single criteria employed, it is probable that reactivity is one of the greatest practical value. The importance of a survey of the entire history is shown in the manner in which a reactivity, which may not be apparent to the psychotherapist in his daily encounters with the case, becomes evident when the whole condition is looked at in retrospect. In this way the mistake of abandoning active therapy in a case not responding may sometimes be avoided.

MENTAL DISEASES. (*See also* DEMENTIA PARALYTICA; DEMENTIA PRECOX.) Henry Devine, M.D., F.R.C.P.

FOCAL SEPSIS IN THE PSYCHOSES.

Sphenoidal Sinusitis.—At the Birmingham Laboratory of the Joint Board of Research for Mental Diseases work has been directed especially towards the investigation of the relationship between chronic disease of the sphenoidal sinus and pituitary gland and mental diseases. T. C. Graves and F. A. Pickworth¹ found that of the cases admitted during 1927, ear, nose, and throat disease was present in 50 per cent. In many cases a history may be obtained of an acute infection before puberty. Others have had symptoms of long-standing chronic infections. Various signs and symptoms of sinus disease are found to be met with in mental disorder: (1) General toxæmia—circulatory disturbances, with high or low blood-pressure, pallor or cyanosis, intermittent slight pyrexia, malnutrition; (2) Local effects—herpes, cutaneous sepsis of face, conditions resembling erysipelas, and conjunctivitis; (3) Delusions founded on a basis of local nerve irritation; (4) Remote effects—gastro-intestinal disorders, sensations of fullness in the epigastrium, sinking feeling, pain resulting in hypochondriacal delusions. Treatment consisted of **Removal of Inspissated Pus and Polypi, and Intranasal Drainage, Removal of Adenoids, Dissection of Tonsils**, as indicated by the findings, and a course of intravenous injections of **T.A.B. Vaccine** in some of the cases. As regards the effects of treatment, it was found that in some cases substantial improvement occurred within a month, but a larger number improved slowly over a period of six months. A few showed delayed improvement after six months.

F. A. Pickworth² describes the post-mortem findings in a case of confusional insanity with empyema of the sphenoidal sinus. He discusses the pathology and relationship of an infected sphenoidal sinus, with photographs illustrative of the spread of streptococci from the sinus into the cranial cavity. Special reference is made to the pituitary gland, which also contained organisms. It is suggested that the symptoms observed in sixty-nine cases of insanity in which a sphenoidal infection had been demonstrated might be attributable to a secondary involvement of the pituitary gland. Pickworth is of the opinion that a sphenoidal sinusitis may in certain circumstances affect the pituitary-hypothalamic region of the brain even though no *macroscopic* perforation of the pituitary fossa is present, such as occurred in the case described. Another chronic psychotic patient was also found to present definite post-mortem evidence of the following: Caries of the sphenoid bone; great thickening of the dura mater; thickening and polypoidal condition of mucous membrane of the sphenoidal sinus; much involvement of the pituitary gland in the septic process.³

In another communication T. C. Graves¹ states that many physical symptoms met with in mental disorder are explicable on the basis of infection passing directly from a diseased sphenoidal sinus to the pituitary gland and hypothalamic region of the brain, the latter containing the head ganglion of the sympathetic nervous system. Cases of sphenoidal sinus disease are met with in which there is a failure to give a normal response to pyrexial therapy, indicating functional inertia of the thermal centre in this part of the brain. Case-histories of newly admitted patients frequently contain references to nasal catarrh persisting from childhood, associated sometimes with a family history of nasal catarrh, to which the writer attaches considerable significance. In a typical case the sequence is as follows: Nasal catarrh, *sometimes before* or *definitely following* an acute infectious malady, such as measles or scarlet fever; later headaches appear, then an acute exacerbation of headache is

followed by mental symptoms, and so the case passes into an acute phase of mental disorder. Sometimes before the onset of the psychosis the catarrh apparently diminishes, pointing to the deeper extension of the pathological processes responsible for the catarrh.

Influenza.—As a result of studies in psychoses related to influenza, T. C. Graves⁵ concludes: (1) In persons without psychotic inheritance but with pre-existing septic diseased states in the head, which may date from childhood, an attack of influenza, by causing an acute exacerbation of the pre-existing pathological process, may precipitate serious mental disturbance even though constitutional symptoms of influenza may be slight or absent. (2) The pre-existing pathological processes may be responsible, directly or indirectly, for pathological changes elsewhere in the body, and from these collectively further toxæmia may ensue. When these secondary processes have subsided, the original focus in the head does not necessarily return to the same status obtaining before the acute exacerbation, and some of the mental symptoms displayed during the acme of the acute process may persist. (3) The mental symptoms and the corresponding pathological conditions of septic foci with deficient or defective drainage may continue indefinitely, being subject to periods of exacerbation and quiescence. (4) The usual influenzal symptoms displayed by a normal or otherwise relatively healthy person may show considerable differences from those occurring in persons with an existing chronic septic process in the head. (5) Within the skull, therefore, pathological processes may exist, the extent of which may determine the degree of mental symptoms displayed.

Oral Sepsis.—G. W. Henry and M. C. H. Doyle⁶ find that focal infection frequently occurs in the root canals and pulp chambers of teeth. Over 50 per cent of teeth ordinarily extracted from psychotic patients contain streptococci, and 10 per cent contain hæmolytic streptococci. Pathogenic streptococci occur with equal frequency in the teeth of both psychotic and non-psychotic patients, and no specific relationship between dental infection and any particular type of psychosis was observed. Dental X-ray photographs give accurate indication of infection in about 75 per cent of cases, and should be made of the teeth of all psychotic patients.

W. M. F. Robertson⁷ gives an account of his investigations on gastrointestinal focal infection in relation to oral sepsis. He concludes that in mental disorders gastric dysfunction, especially hyperchlorhydria, is present to a much greater extent than in normal individuals. The importance of free hydrochloric acid as a bactericidal barrier has been proved, and the relationship between this fact and that of the production of gastritis has been established. Bacteriological methods show that oral sepsis can be traced throughout the alimentary canal. Anaerobic methods are considered essential if the full significance of the special types of infections present is to be realized.

Intestinal Toxæmia.—T. C. Graves⁸ describes a method of **Continuous Colon Irrigation**, together with a table arranged for this purpose. The advantages of the method of mechanical and antiseptic treatment of intestinal toxæmia over the ordinary non-continuous irrigation are many. In contrast with the ordinary method, the continuous irrigation method allows large quantities of fluid to be used following one insertion of the tube. Observation of the content and character of the return flow can be made with ease. Air and gas are easily eliminated and samples of the return are easily obtainable. Above all, except in those cases in which the sphincter tone is weak, the whole irrigation can be carried out with absolute cleanliness, and complete absence of foul odour in the room. On the slightest indication of discomfort the sewer tap can be opened, thus releasing the pressure, and the container tap immediately closed.

Elimination of Focal Infection.—G. H. Kirby and N. Kopeloff,⁹ whose previous studies on the relation of focal infection to mental disease were adversely criticized, state that there are three important questions requiring consideration in regard to this subject: (1) Is focal infection the specific *cause* of the functional psychoses? (2) Can the surgical removal of the foci of infection *alone* bring about improvement and recovery of patients with mental disease? and (3) Is focal infection of importance in mental disease? Their studies indicate clearly that the first two questions must be answered in the negative. With regard to the third question, the writers feel that it can only be said that so long as there exist no satisfactory criteria for evaluating the relative importance of each of the factors which enter into mental disease we must suspend judgement and gather further facts or develop better methods. Their former view is reiterated to the effect that "it is desirable to eliminate focal infection when adequately demonstrated in psychotic patients in the same way as one should attempt to alleviate any physical disorder in mentally diseased patients. Nevertheless it has not been shown that focal infection is the etiological factor in the functional psychoses."

TREATMENT OF THE PSYCHOSES.

G. E. Reed¹⁰ gives an account of his experience in the treatment of dementia præcox by intravenous injections of **Manganese Chloride**. Reiter and Bisgard and Schrijer had each reported fifty cases of dementia præcox treated in this way, with 50 per cent of the cases improved. These investigators were unanimous in recommending three precautions: (1) To avoid treating cases with active organic disease; (2) To treat each case individually in regard to the dose of the drug; (3) That all patients under treatment should have duly recorded the character and quality of the pulse, temperature, and respirations. The findings aid in determining the optimum dose. A selection of thirty cases, representing as nearly as possible all types of dementia præcox, was made. These patients were put to bed under observation for two weeks; a physical examination, urinalysis, blood-count, and sedimentation test were made and a clinical record kept. The treatment was then begun, and consisted in an intravenous injection of from 2 to 8 c.c. of a 0.02 molar solution of manganese chloride. Thirty injections in all were thus given to every patient in the course of fifteen weeks. They were given 0.3 grm. of manganese chloride by the mouth twice a day for a month after the intravenous injection was stopped. When the drug was given by the mouth a tendency to catharsis was noted. The amount given was determined by the appearance of a slight reaction. This consists in a transitory erythema of the face and conjunctivæ associated with a feeling of warmth, but not accompanied by any change in the pupils, blood-pressure, or pulse-rate. This 'reaction' was obtained by a definite individual dose in all but two patients, who then received the maximum dose each time. Half the group received a dose sufficient to cause a 'flush' or 'reaction'; the other half received 2 c.c. less than the amount in their particular cases which would cause the reactions. A sedimentation test was done during and after the treatment; this is of value in estimating the optimum dose. The clinical record was stopped at the end of the treatment. The cases were reviewed one year later; the table on the opposite page shows the results.

These investigations lead the writer to the following conclusions: (1) Manganese chloride, as used above, may be expected to improve the physical condition of many patients with dementia præcox. (2) The salt is contra-indicated in larger doses than recommended, if given repeatedly. It will cause an exacerbation of physical symptoms if any major organic disease is

demonstrated or even suspected. One of the essentials would appear to be that the optimum dose must not be exceeded. Hence with the present technique and dosage it should not be used in a routine manner. (3) The weight-chart and the sedimentation tests have proved the most valuable indices of the general condition of the patient and for ascertaining the optimum dose. (4) A substantially higher discharge-rate amongst the cases with manganese than in similar cases not receiving treatment was observed. It is felt that more work will be required, and is justified, to determine whether the improvement is real or apparent.

ANALYSIS OF THIRTY CASES TREATED BY MANGANESE CHLORIDE.

| | NO. OF CASES | PER CENT |
|--------------------------------|-----------------|-------------|
| 'Reaction' to manganese | 28 | 93.0 |
| Rapid sedimentation test | 25 | 83.0 |
| Improved sedimentation test .. | 15 | 50.0 |
| Improved physically | 17 | 56.0 |
| Improved mentally | 11 | 36.6 |
| Definitely worse physically .. | 2 | 6.6 |
| Definitely worse mentally .. | 1 | 3.3 |

100 untreated cases gave 18 per cent discharged improved in the same time.

A. Danby and K. Sykes¹¹ give an account of the successful treatment of a case of chronic mental disease associated with ovarian dysfunction. The patient was of the confusional type and had been under care for several years. A gynaecological examination disclosed lacerated and infected cervix associated with subinvolved uterus. The right ovary was prolapsed, enlarged, and tender. **Endocrine** and **Non-specific Protein Therapy** were tried, and injections of **Collosol Calcium** were also given. The tonsils were dissected and the antrum drained. Some improvement was observed, but it was noted that the symptoms again increased in severity during the whole of the menstrual period, and also for three or four days before and after the menstrual flow. **Curettage** of the uterus was carried out, and subsequently a right **Salpingo-oöphorectomy** was performed and a cystic portion of the left ovary was resected. Following this treatment the patient gradually recovered, and has remained well for nearly a year after leaving the hospital. The outstanding feature of this case is the remarkable exacerbations of mental symptoms at a particular cycle, and their complete remission after resection of the diseased part of the ovary.

M. Keyes¹² draws attention to the fact that pelvic disease, sterility, the thwarted or abnormally active reproductive instinct, or involuntary incomplete consummation of marriage are liable to be accompanied or followed by a degree of mental unbalance. Some notes are given on the pelvis as a focus of sepsis, and the treatment is briefly outlined.

Protein Therapy in Insanity.—J. R. B. Robb¹³ writes on this subject. In 'toxic confusional insanity' some cases after a short illness end fatally, whilst others presenting an almost similar clinical picture make a rapid recovery. Many clear up after some months, and others drift into dementia. The duration and outcome are in a number of cases matters of speculation. Little or nothing is known of the toxins, their origin, or their antibodies, and consequently treatment tends to become non-specific. If the patient makes a rapid recovery, it is reasonable to assume that he has produced the necessary antibodies and complement to destroy the toxins. When he remains confused and physically exhausted for months, it is possible that he is producing antibody but cannot make the balance in complement. The fact that confused

and stuporose cases sometimes become mentally clear during an intercurrent illness may be due to the upsetting of the relative proportions of the complement to antigen and antibody, thereby giving the antibody a temporary control over the antigen. Robb states that the following method appears to produce an increase of free complement. Human serum when withdrawn and allowed to stand for a few days is alleged to become 'anticomplemental', at least its presence in some way inhibits the action of complement in fresh serum. On this hypothesis the 'anticomplemental' serum is injected into the patient in the hope that any free complement will be absorbed, thereby stimulating a physiological increase of fresh complement—an analogy being the administration of an alkali to stimulate the production of HCl in the stomach. After an injection of the serum, complemental estimates indicated an initial fall followed by a rise, the leucocytic cell-count following the same curve.

Technique of Treatment.—About 90 c.c. of blood are drawn into a test-tube from the cubital vein. The test-tube is rotated; the blood is put on ice; in twenty-four hours the serum is separated and centrifugalized; 2 c.c. are retained for complement estimation, and the remainder is put up in a sterilized serum bottle with a rubber cap. This is left on the ice for five days, 0.04 c.c. of carbolic acid per 100 c.c. of serum being added on the fourth. On the first day of treatment 2 c.c. of serum are given subcutaneously (abdominal wall), followed in one hour by 6 c.c.; on the third day 12 c.c. are administered; on the fifth 25 c.c.; and on the sixth another 25 c.c. Complement should be estimated in twenty-four hours. Three or four courses of injections may be necessary before obtaining a rise in free complement. It is advisable to estimate complement before and after each course of injections.

Results of Treatment.—After the first injections the condition of the skin and mouth becomes much cleaner. Although confusion persists, mental improvement is first noted in the fact that the patient is less restless, sleeps better, takes more food, and tends to be cleaner in habits. Eventually the patient has short lucid intervals which gradually become longer. The improvement, which appears to have some relation to the increase in free complement, should take place in the course of a few weeks. The writer briefly discusses other methods of producing protein shock for therapeutic purposes.

THE AMELIORATION OF MENTAL DISEASE BY INFLUENZA.

K. A. Menninger¹⁴ observes that the fact that any somatic disease may influence favourably any mental disease is a matter of great theoretical and practical importance. The malarial treatment of paresis is of course an example of its utilization; but its theoretical implications extend far into the complicated questions of the interrelations of psychic and somatic disease and touch intimately on the important problem of reversibility. Symptom manifestations of mental illness are sometimes: (1) Precipitated by somatic infectious disease; (2) Aggravated by somatic infectious disease; or (3) Ameliorated by somatic infectious disease. As far as (1) and (2) are concerned, all types of mental disease and all types of infection are included. For example, it is known that influenza, as well as other fevers, trauma, and psychic stresses, may provoke into expression schizophrenia, deliria, mania, or melancholia. As regards the ameliorative process, it is known that various of these mental disease pictures may be favourably influenced by almost any infectious diseases. The writer's own particular interest in this field has been influenza, and this study deals particularly with specific instances of its ameliorative effects on mental disease. Its deleterious effects are so many and so well known that this should make more interesting its effects in the opposite direction. A study of the cases in the literature is made, and the writer

records six cases of cure or amelioration of his own. An analysis of the cases is presented below :—

| | | | | | |
|---------------------------------|----|--|--|---|--|
| <i>Sex :—</i> | | | <i>Presumptive or Stated Diagnoses :—</i> | | |
| Males | 9 | | | | |
| Females | 7 | | | | |
| Unknown | 2 | | Mania | 3 | |
| <i>Duration of Psychosis :—</i> | | | Melancholia | 2 | |
| 1-1½ years .. | 7 | | Probably schizophrenia .. | 7 | |
| 2-4 years | 3 | | Organic brain disease .. | 2 | |
| 5-15 years .. | 6 | | Epilepsy | 3 | |
| Unknown | 2 | | Migraine | 1 | |
| <i>Result :—</i> | | | <i>Presumptive or Stated Diagnoses of the 11 Cases reported 'Cured' :—</i> | | |
| Cured | 11 | | Mania | 1 | |
| Improved | 3 | | Melancholia | 2 | |
| Remission | 4 | | Schizophrenia | 4 | |
| | | | Organic brain disease .. | 1 | |
| | | | Epilepsy | 2 | |
| | | | Migraine | 1 | |

Various theories have been advanced to account for the amelioration of mental illness with the onset of infections, and Menninger himself suggests that from the purely mechanistic standpoint the process closely parallels the phenomena of catalysis. An enzyme or other catalytic agent acts to accelerate certain reactions in a direction in which they were already slowly moving. No change in energy relations takes place, and the catalytic agent does not enter into the reaction. (The influenza, for example, comes and goes, leaving or taking nothing.) Furthermore, the same catalytic agent which promotes a reaction in a certain direction may effect the reversibility of that reaction—that is, may promote it in exactly the opposite direction, under certain environmental conditions. Ptyalin, for example, which induces starch rapidly to become sugar, may convert sugar into starch under certain circumstances of temperature. This is precisely what seems to occur in the problem under consideration. Infectious disease is known to hasten the disintegrative processes and tendencies of certain personalities, occasionally to the point of breaking—that is, of breaking out, as it were. Just how it accomplishes this we do not know. What we do know is that a certain mass reaction occasionally follows, and much less frequently precisely the opposite reaction takes place. This, the writer submits, is exactly parallel to catalysis.

As regards the psychodynamics involved, the writer suggests that psychologic factors are probably identical with those with which we are familiar under various guises. Recoveries following accidents, hemorrhages, parturition, suicidal attempts, legal crises, and surgical operations are all to be regarded as accomplishing a reconciliation of the distraught and warring processes of the unconscious with a declaration of peace. The gratification of Freud's recently postulated death instinct, the assuaging of the demand for propitiatory suffering from an unconscious sense of guilt, the threat to the extinction of the ego—these and many other possibilities appear which could only be chosen between by individual and penetrative case study. In general, what must occur is a redistribution of libidinous streams, some of which are released from investment in unpropitious directions. A corollary problem is raised, however, which may throw light on the general principles involved. Not infrequently this phenomenon is observed: a patient with a chronic or recurrent physical ailment, but free from psychic distress, presents himself at a medical or surgical clinic for treatment. Successful removal of the disorder is then promptly followed by mental illness. In these cases, the writer suggests, the removal of the pain—the punishment, the attrition—results in

the appearance of a previously restrained flood of self-attacks of another sort. This is precisely the reverse of the phenomenon of amelioration of mental disease by infectious somatic disease.

REFERENCES.—¹*Jour. Laryngol. and Otol.* 1928, Aug., 545; ²*Brit. Med. Jour.* 1929, i, 721; ³*Jour. Laryngol. and Otol.* 1929, Nov., 750; ⁴*Jour. of Ment. Sci.* 1930, Jan., 53; ⁵*Jour. Neurol. and Psychopathol.* 1928, Oct., 97; ⁶*Amer. Jour. Psychiat.* 1929, viii, 915; ⁷*Proc. Roy. Soc. Med.* 1929, xxii, 1373; ⁸*Jour. of Ment. Sci.* 1930, April, 306; ⁹*Ibid.* 1929, April, 267; ¹⁰*Canad. Med. Assoc. Jour.* 1929, July, 46; ¹¹*Lancet*, 1929, i, 129; ¹²*Jour. of Ment. Sci.* 1930, Jan., 91; ¹³*Brit. Med. Jour.* 1930, i, 1169; ¹⁴*Jour. Amer. Med. Assoc.* 1930, March 1, 630.

MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.

Henry Devine, M.D., F.R.C.P.

Included in the *Transactions* of the Third Session of the Australasian Medical Congress¹ is a useful and informative discussion of the problem of the relationship between injuries and subsequent mental disturbances. For the practitioner this subject is one of peculiar interest and importance, since questions of compensation and prognosis are very liable to arise. S. J. Minogue gave statistics which confirmed the view expressed by most psychiatrists that the incidence of traumatic insanity is surprisingly small. His percentage is greater, however, than that of other writers, as all traumatic cases who become delirious are certified as insane and admitted to the mental hospitals in New South Wales, whereas in New York and elsewhere such patients are often treated in special hospitals. The following shows the incidence of traumatic psychoses and neuroses in 13,197 admissions to Callan Park and Broughton Hall since 1910:—

| | |
|--------------------------------------|-----|
| General psychiatric conditions | 57 |
| True traumatic insanities | 118 |
| Trauma in senile patients | 13 |
| Neuroses | 40 |
| Neurological conditions | 2 |

The percentage of true psychoses was 2·3 on the total number of cases. Practically every type of mental disease may be met with after trauma—manic-depressive and schizophrenic conditions, cerebral syphilitic states, and paranoid reactions. In such cases the trauma can be regarded only as a precipitating factor in a predisposed individual. The only true and characteristic mental and nervous sequelæ of trauma are: (1) confusion, (2) dementia, (3) traumatic epilepsy, and (4) moral imbecility. The confusional syndrome is the one most frequently observed. The following table shows the prognosis in 89 cases belonging to the confusional group:—

| CONDITION | MALES | | | | FEMALES | | | | TOTAL |
|--------------------------------------|-----------|-------------------------------|----------|------|-----------|-------------------------------|----------|------|-------|
| | Recovered | Discharged not improved | Demented | Died | Recovered | Discharged not improved | Demented | Died | |
| Fractured skull and concussion .. | 12 | 2 | 3 | 10 | 3 | — | — | 1 | 31 |
| Head injuries in alcoholics .. | 18 | 2 | 3 | 7 | — | — | — | 1 | 31 |
| Body injuries in alcoholics .. | 6 | — | 1 | 1 | 3 | — | — | 2 | 13 |
| Other causes .. | 1 | — | — | 5 | 1 | — | — | 3 | 10 |
| Trauma predispos- ing factor .. | 4 | — | — | — | — | — | — | — | 4 |
| Total .. | 41 | 4 | 7 | 23 | 7 | — | — | 7 | 89 |

From the standpoint of the practitioner the *traumatic neuroses* offer more complex problems than the relatively rare traumatic psychoses. Sir Henry Newland observes that in both war and civil cases a wound or injury—the organic factor—however slight it may be, “acts as a bait for the hysterical symptoms which settle in the region of the trauma and which usually survive the exciting cause”. The pain of the wound or injury, and the inhibition of movement resulting from it, are often the starting-point of a process of auto-suggestion. Newland points out that the compulsory insurance of workmen has led to a great increase in functional nervous disorders, though not all occupations contribute to the total. The interesting observation is made that those who are absorbed in their calling but rarely develop functional nervous disorders. The instance of jockeys is cited—a class which in proportion to its numbers is probably more often subject to trauma than persons in any other occupation, and yet, Newland states, he has never seen an injured jockey develop a functional neurosis. He believes that traumatic neuroses are largely preventable if they are regarded as definite psychological disorders and promptly treated as such by the practitioner.

The questions of *prognosis* and *compensation* in the traumatic neuroses are intimately related. H. F. Maudsley states that there is no doubt that the present administration of compensation is conducive to the continuance of functional nervous disorders, more especially if litigation arises out of compensation disputes. The general experience is that many cases of functional nervous disorders do not tend to abate so long as compensation is being paid. Litigation over compensation almost invariably increases nervous symptoms. He believes that a more widely spread knowledge of psychological medicine would be of the greatest assistance in the management of early functional symptoms arising from the conditions of trauma.

S. J. Minogue's study of traumatic neuroses reveals some striking facts. Of the 31 males in the series 20 were receiving compensation; 19 of these were married, with families of three or more. Most of them were middle-aged unskilled tradesmen and generally of an inferior degree of intelligence. The only single man was a defective Irish peasant. In contrast only 4 out of the 11 non-compensated cases were married. Another striking feature is that in 5 cases there was a history of previous traumatic neuroses for which compensation was paid. One patient had had three ‘sprained backs’ in twelve months. The first lasted three weeks, the second five weeks, and the third has become chronic; he is now a hopeless traumatic neurasthenic. Another patient had numerous traumatic neuroses in the past and has received compensation for them all.

The prognosis in these cases depends almost entirely on whether the patient is in receipt of compensation or not, as is well seen from a study of the following table:—

| CONDITION | COMPENSATION | | | | NON-COMPENSATION | | | |
|-----------------|----------------|---|-----------|---|------------------|---|-----------|---|
| | Total Patients | | Recovered | | Total Patients | | Recovered | |
| | M | F | M | F | M | F | M | F |
| Hysteria .. | 9 | 2 | 1 | 1 | 5 | 4 | 4 | 3 |
| Neurasthenia .. | 11 | 1 | 2 | — | 3 | 1 | 3 | — |
| Psychasthenia | — | — | — | — | 3 | 1 | 2 | — |
| Total .. | 23 | | 4 | | 17 | | 12 | |

Thus in 4 out of 23 compensation cases the patients recovered, whilst in 12 out of the 17 non-compensation cases recovery occurred. The contrast becomes more marked when it is realized that in the four compensation cases recovery occurred only when the compensation claim was settled by the payment of a lump sum. The writer states that the figures are too small to draw any definite conclusions. Nevertheless, they strongly support the teaching of modern psychiatry that the prognosis in which compensation claims enter is well-nigh hopeless. The hopelessness of the prognosis can be understood only by a study of the patients themselves. They are generally of an inferior degree of intelligence, and they find the competition of life is becoming increasingly difficult for them. Their means of livelihood is precarious; the cost of living is ever increasing; they have a wife and family to support—their illness is a haven of refuge to them. They have an assured income; no longer have they to fight their unequal battle in the struggle of life. On the other hand, other patients are remarkably plausible and they are schemers; they are always ready to receive money without having to work for it. To them an accident is a godsend. Much better is it for them to receive less than the basic wage and do no work, than to receive the basic wage and work forty-four hours.

In a short contribution to this discussion J. P. Lowson develops the view that when mechanical trauma is followed by a functional nervous disorder, the trauma itself as a rule acts singly by letting loose the consequences of a previously existing mental instability. It furnishes a point upon which the patient's previous instability can, as it were, precipitate itself. A case is cited in which an analysis of the patient's readily accessible and superficial conflicts, which the trauma had stimulated, was instrumental in bringing about recovery.

Maudsley deals particularly with a special variety of trauma, namely, *head injuries*. He points out that the after-effects of head injuries do not quite fall into line with the results of injury to other parts of the body. Symptoms suggestive of functional neurosis may be present when there is a considerable amount of cerebral injury often without any significant neurological signs. Fracture of the skull is certainly not necessarily a criterion to the extent of cerebral damage sustained. There may be localized bruising, which gave no rise to concussion at the time of the injury, and the headaches complained of so often after an injury are not generally psychoneurotic in origin. Maudsley gives the following table showing the after-effects of head injuries in thirty-eight patients:—

| TYPE OF HEAD INJURY | Number of Patients | Average Number of Days in Hospital | RETURNED TO WORK | | LIGHT WORK | | Chronic Condition | Mental Impairment or Psychosis |
|--------------------------------|--------------------|------------------------------------|------------------|----------|------------|----------|-------------------|--------------------------------|
| | | | Six Months | One Year | Six Months | One Year | | |
| Fracture of the skull .. | 9 | 42 | 2 | 1 | 2 | 1 | 3 | 2 |
| Concussion without fracture .. | 14 | 10 | 0 | 2 | 1 | 1 | 10 | 2 |
| No concussion or fracture | 15 | 2 | 2 | 4 | 2 | 1 | 6 | — |
| Total .. | 38 | — | 4 | 7 | 5 | 3 | 19 | 4 |

Those patients suffering from fracture of the skull were kept in hospital for at least a month. The after-effects in the form of neurosis were not so

pronounced as in those in whom the injury was presumably not so severe, but their stay in hospital was for only a short period. It would seem that fracture patients who survive are returned to their full working capacity more quickly than patients with head injury without fracture. The primary factor of importance is to treat head injuries as serious medical cases in the first instance. The patient should be kept in bed for some weeks, and **Lumbar Puncture** and **Hypertonic Solutions** should be freely employed. Any mist of functional neurosis symptoms that may arise must be cleared away in order to allow the injured cerebral cells to regain their normal function.

H. S. Stacy emphasizes the necessity of a thorough examination in every case of trauma, especially in *head and back injuries*, and cites instances where the diagnosis of 'functional' has been made when organic lesions existed. Little stress, he observes, can be laid upon the absence of fracture in head injuries. In its absence the cerebral damage may be considerable. Though in the main the severity of a cerebral injury can be gauged roughly by the length of the period of early unconsciousness, still there are cases in which, for example, a glancing blow on the head may inflict a localized cerebral contusion without any signs of concussion, and others in which subdural hæmatoma may form and cause no symptoms for some weeks.

When it is remembered that retrograde amnesia extending to a period of fifteen to twenty minutes prior to the accident usually exists in cases of head injury, it will readily be seen how anxious a patient seeking compensation may be when he realizes that most of the evidence he has to offer is his own word that such and such a symptom exists. For focal signs are usually lacking; if present, they are more or less a matter of fortune; quite a large area may be silent. The commonest symptoms complained of are headache, giddiness, and mental instability, inability to concentrate, homicidal or suicidal tendencies, and lack of emotional control. Epilepsy may develop as late as ten years after the accident. The diagnosis of injuries to the spine and to the spinal cord is also discussed.

As regards injuries to the back, Stacy observes that pain low down in the back is the most frequent source of confusion; it is most common because it is the origin of muscles that are most apt to be affected in any sudden strain thrown upon them. If the patient is made to place his finger on the most painful area, it will usually be found to correspond to an anatomical structure that by its position is prone to be the seat of great pain. The writer refers particularly to tendinous structures in the vicinity of the sacro-iliac region. Intensity of pain is largely dependent on density of structure: the more dense, the greater the tension under which the extravasation of blood is; the greater the tension, the greater the pain. By reflex paths this pain is apt to spread into other parts in the vicinity, for example, along other sacral nerves, in some cases simulating sciatica. If the origin of such a muscle as the *sacrospinalis* is affected, it is obvious that absolute rest is not easy to obtain unless the patient is put to bed. This is difficult to enforce and is seldom done—hence union of ruptured fibres is delayed and pain is prolonged over a period of many weeks or months, and the patient is thought to be a malingerer or a sufferer from one of the functional nervous diseases.

REFERENCE.—¹*Trans. Third Session Australasian Med. Congress, 1929, 45.*

MERYCISM. (See RUMINATION.)

MESENTERIC LYMPHADENITIS. (See LYMPHADENITIS, MESENTERIC.)

MITRAL STENOSIS.

A. G. Gibson, M.D., F.R.C.P.

TREATMENT.—On the hypothesis that there is a 'sympathetico-tonic' form of mitral stenosis, L. Gravier¹ has had one case subjected to **Excision of the Stellar Ganglion**. The patient, a woman, age 30 years, had crises of tachycardia, accompanied by extreme flushing of the face, neck, and chest, provoked by the least emotion, such as signing her name. Drugs had been entirely useless. The operation was followed by the disappearance of vasomotor symptoms and the diminution in the tachycardia. While the relief of the patient was considerable, the results were only partially satisfactory.

REFERENCE.—¹*Presse méd.* 1930, Jan. 22, 9, Supp.

MONGOLIAN IDIOCY. (See MENTAL DEFICIENCY.)**MUMPS.**

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—M. A. Rabinowitz and B. Seligman,¹ after alluding to the paper by Wesselhoeft (see MEDICAL ANNUAL, 1922, p. 284), who collected sixty-four cases of mumps orchitis without parotitis, reports a personal case of *primary mumps orchitis*. The patient was a man, age 29, who developed a swelling of the left testicle of three weeks' duration. The diagnosis was made by the absence of gonorrhœa, instrumental or other trauma, and by the discovery that his daughter had had a mild attack of mumps a fortnight before he had been taken ill.

E. E. Zemke² records three personal cases of mumps complicated by *meningo-encephalitis* in males aged 11, 17, and 36. In the first case there was no definite history of mumps, but an epidemic of mumps was prevalent, and there was a history of probable contact. The symptoms were frontal headache, fever, vomiting, and irritability. Rapid recovery followed **Lumbar Puncture**. In the second case definite parotid involvement was followed by delirium and amnesia, which cleared up rapidly after lumbar puncture. In the third there was a history of mumps in the family, and the patient suffered from orchitis with meningeal symptoms, which cleared up promptly after lumbar puncture.

R. J. Weissenbach, G. Basch, and M. Basch,³ who record twenty-one illustrative cases in patients aged from 3 to 36 years, state that the prognosis of *primary mumps meningo-encephalitis* is remarkably good, though occasionally relapses may occur. In only a few instances have there been sequelæ in the form of asthenia, headache, and epileptiform attacks.

F. C. A. Thiriet⁴ has collected twelve cases, two of which are personal, of *polyneuritis* in mumps. The ages of the patients ranged from 4½ to 55 years. The symptoms were principally motor, but there were also some sensory changes. Complete recovery took place in all in from two to six months' time.

REFERENCES.—¹*Med. Jour. and Record*, 1929, cxxx, 215; ²*Minnesota Med.* 1930, Feb., 107; ³*Ann. de Méd.* 1930, Jan., 5; ⁴*Thèses de Nancy*, 1928–9, No. 414.

MYXEDEMA. (See THYROID GLAND.)**NÆVUS.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Treatment of Vascular Nævi.—G. B. Dowling¹ advocates the injection of a thrombosing solution into cavernous nævi as a method of treatment. He has treated a number of cases of small nævi by injecting a minim of a solution of **Quinine Bihydrochloride and Urethane** into four or five different places in the nævus. This is repeated two or three times at intervals of a fortnight, and then the treatment is suspended for a few months, when further injections can be given if necessary.

REFERENCE.—¹*Lancet*, 1929, ii, 1251.

NASAL SINUSES, DISEASES OF. (*See also* X-RAY DIAGNOSIS.)*A. J. M. Wright, M.B., F.R.C.S.*

Treatment of Malignant Disease by Radium.—The technique of the treatment of malignant disease by radium has still to be evolved by clinical observation. The principles laid down by N. Asherson,¹ as a result of his experience in treating cases of malignant disease of the nose and upper jaw, are of some importance. In regard to possible damage to the eye by radium, he finds that a dosage up to 2100 mgrm.-hours of element screened with 0.5 mm. of platinum can be safely employed in close proximity to the conjunctiva, no more than a slight conjunctivitis being produced. A dosage of 3000 mgrm.-hours with the same screening may be safely given in close proximity to the optic nerve—that is, in the posterior ethmoidal region. A similar dosage will not produce more than an erythema of the skin of the cheek, which passes off in a few weeks. A dosage of 1000 mgrm.-hours in close proximity to the hard palate or bony septum will, after a latent period of some weeks, produce necrosis and be followed by perforation, which, however, is limited in extent. Epithelioma on the anterior surface of the upper jaw is radiosensitive. Sarcoma of the upper jaw and tonsil reacts readily to radium. A dose of 2000 mgrm.-hours placed in the centre of such a tumour will usually cause its complete disappearance. Within six months, however, the tumour probably reappears, and further radium treatment produces no effect. The recurrence may in fact grow more quickly than the original growth.

Nasal Sinusitis and Bronchiectasis.—That nasal sinus suppuration is found, if looked for, in a large proportion of cases of bronchiectasis is undoubted. That the bronchial suppuration is secondary to the nasal is not as yet proved, and opinions still differ as to how far surgical treatment of the sinus suppuration is likely to improve the lung. L. Quinn and O. Meyer² found nasal sinusitis present in 38 patients with bronchiectasis, the diagnosis being confirmed in all cases by a radiogram of the chest after the introduction of iodized oil. In the majority of cases no obvious nasal symptoms existed. They conducted a series of experiments to show how easily pus may be aspirated from the nose into the bronchi. The experiment consisted in the introduction of iodized oil into the nose of individuals during sleep induced by morphia. Of 11 individuals on whom the experiment was carried out, in 5 X rays showed that the iodized oil had been aspirated into the lung. A similar aspiration may presumably take place in cases of chronic nasal sinus suppuration.

I. R. Smith³ emphasizes the importance of obtaining a thorough history of cases of chronic bronchial suppuration. If this is done, it will frequently be found that a specific fever was responsible for both the nasal sinus and bronchial suppuration. He states that no chronic suppurative chest condition has been adequately examined unless a thorough search for a focus of infection in the head has been carried out. A mere negative history on the patient's part is of no importance. Out of 20 cases of chronic broncho-pulmonary suppuration, J. Adam⁴ found that 11 were associated with nasal sinusitis, and in all the antrum was affected.

Nasal Sinusitis in Children.—The existence of nasal sinusitis in children is receiving increasing attention. Owing to the later development of the other nasal sinuses, in children up to the age of 7 years the antra only are affected. It is generally taught that where a nasal sinus suppuration exists in combination with infected tonsils and adenoids, removal of the latter should be the first step in treatment and usually results in cure of the sinus suppuration. I. R. Vailes⁵ suggests that this line of treatment is mistaken, and that in many cases the sinusitis is unrelieved or even aggravated by the preliminary removal of tonsils and adenoids. He states that 80 per cent of cases of chronic sinusitis

in children can be cured without operation. Such treatment consists in the clearing of the nasal passages daily of secretion by **Suction**, combined with exposures to **Radiant Heat**. In addition, 10 drops of a 25 per cent solution of **Argyrol** are dropped into the nasal passages twice daily by the parent, the patient also being instructed in the efficient blowing of the nose. In cases in which resolution does not take place under this treatment, the making of a large intranasal opening into the antrum is successful. L. W. Dean⁶ emphasizes the importance of **Constitutional Treatment**. He considers that deficient diet, poor hygiene, allergy, endocrine disturbance, or diseased tonsils and adenoids are important factors. Fresh air and general constitutional treatment are of great importance, and in early cases a 1 per cent solution of **Ephedrine** as a spray is helpful by promoting drainage.

X-ray Examination of Nasal Sinuses.—The use of some form of iodized oil as an aid to the X-ray examination of sinus cases was somewhat fully dealt with in the *MEDICAL ANNUAL*, 1930, p. 353. By its use it is possible to define the existence of generalized thickening or polypoid hypertrophies of the lining membrane. A. W. Proetz⁷ sounds a warning note as to the interpretation of such findings. He states that very considerable but temporary thickening of the antral mucosa may take place in allergic attacks, that such thickening may be confined to a single sinus, and that therefore the finding of a thickening by X-ray examination should not of necessity be followed by operation. He supports his views by radiograms showing the alterations in the thickness of the antral lining over short periods. I. Kubo⁸ has found that **Barium Sulphate** as an emulsion in glycerin is more satisfactory than iodized oil as an opaque injection into the sinuses for radiography.

REFERENCES.—¹*Jour. Laryngol. and Otol.* 1929, Nov., 739; ²*Arch. of Otolaryngol.* 1929, Aug., 152; ³*Jour. Laryngol. and Otol.* 1930, April, 233; ⁴*Ibid.* 271; ⁵*Canad. Med. Assoc. Jour.* 1930, Feb., 198; ⁶*Jour. Amer. Med. Assoc.* 1929, Sept. 14, 838; ⁷*Ann. Otol. Rhinol. and Laryngol.* 1930, March, 87; ⁸*Jour. Laryngol. and Otol.* 1929, Aug., 504.

NASOPHARYNX, ENDOTHELIOMA OF.

Geoffrey Jefferson, M.S., F.R.C.S.

Whilst it is true that tumours in almost any situation and of any type may at times involve the nervous system by embolism of malignant cells (though it is now recognized that pulmonary tumours and metastases are the commonest foci), those which may involve it by direct extension are obviously few. The various epitheliomata about the eyelids, nose, and ear, which may eventually erode the cranium and involve its contents, are not of outstanding clinical interest. The facts of the case are clear to the beholder and the diagnosis offers no difficulty. The case is otherwise when the primary tumour is not visible and when, perhaps, cranial-nerve involvement is the dominating clinical feature. Such a tumour is the endothelioma of the nasopharynx, of which the habits have been made known to us particularly by W. Trotter,¹ by G. B. New,² and by A. J. Gardham.³ This endothelioma is especially interesting because the primary manifestations of its presence are rarely such as would lead the uninitiated observer easily to the correct diagnosis. Trotter in his original paper laid down three special points in diagnosis—third-division trigeminal neuralgia, paralysis of the palate on the side of the tumour, and deafness. Of 9 cases recently analysed by Gardham, in 3 the first sign was enlargement of the glands of the neck, in 3 it was pain in the distribution of the trigeminal nerve, and in 2 deafness. The exact point of origin of the tumour is not known; it is believed to arise in cells above the Eustachian tube up to the base of the skull about the tip of the petrous bone. From there it spreads into the lateral wall of the nasopharynx, but does not often come into view except at a late

stage. The soft palate is later invaded and the growth may come forward towards the alveolar margin, but it is always submucous. The palate is often paralysed on the side of the tumour before it is invaded by growth, and Gardham believes this to be due to involvement of the petrosal nerve rather than infiltration of the levator palati.

The examining finger discovers the endothelioma as a hard diffuse submucous swelling infiltrating the lateral wall of the pharynx high up, and extending to the junction of hard and soft palate. The absence of ulceration explains the rarity of hæmorrhage and of tell-tale odour and spittle; hæmorrhage was present in only one of Gardham's cases. As it infiltrates the back of the superior maxilla it may erode that bone, filling the antrum of Highmore, so that X-ray evidence of opacity in the antrum may be misleading. These characters seem to be definite enough, and to be so peculiar that little difficulty should be experienced in making a correct diagnosis at once. And this is perfectly true, but the fact remains that a correct diagnosis is often long delayed, and for these reasons. The patient is himself generally quite unaware of the real origin of his trouble, and there is a striking absence of nasopharyngeal symptoms. He comes complaining very likely of neuralgic pain in the face, usually in the third division. Sometimes dental caries is found and he is advised to have teeth extracted. But a more careful examination would have elicited the fact that the area of the lip and jaw in which the pain is seated is numb, especially the area supplied by the mental nerve. That is the crucial point. One must always be very much on one's guard when a patient complaining of neuralgia admits that sensation is diminished in the affected part, for sensation is never affected in ordinary trigeminal neuralgia. If the patient has at the same time an abducens palsy, as he may have, the clinician is sure to be on his guard, but he may think the tumour to be primarily intracranial. The reason for the neuralgia lies in the situation of the tumour, which is perfectly placed either to involve the third division of the trigeminal extracranially, or to invade it and enter the skull through the foramen ovale, or to extend along the carotid canal and reach the Gasserian ganglion by local intracranial spread, sometimes reaching the abducens too. Sooner or later in nearly every case involvement of the trigeminal will occur, and it is important to memorize these facts. The pain is rarely paroxysmal or truly intermittent as it always is in classical 'tic douloureux'; the continuous pain will suggest tumour. The deafness which is the leading symptom in other cases is brought about by invasion of the Eustachian tube. The third common early sign is enlargement of the glands of the neck, and again we find a characteristic of the tumour in the nature of this enlargement. The glands are usually bilaterally implicated, though one side may exceed the other, they are moderately large, and are rubbery to the touch, lacking that quality of stony hardness so common in carcinomatous glands. They feel as if they might be tuberculous or lymphadenomatous glands, but differ from the former in their relatively rapid attainment of some size without softening, and from the latter by being quite definitely adherent, but not matted and fused together. Few persons who have not carefully examined the glands in a known case are likely to recognize their pathology the first time they meet with them, whilst once the picture is learned they are not likely to be mistaken for anything else, and the clinician will proceed immediately to search for the nasopharyngeal primary. Such search may not always be attended with instant success in those persons in whom the primary is still small and high up, whilst the glands are already heavily involved, for this happens in some cases. In late cases examination of the nasopharynx may be difficult because infiltration of the internal pterygoid muscle prevents the mouth opening sufficiently.

We have in this tumour, therefore, a most interesting clinical entity, and one in which the first signs and symptoms will often mislead those unversed in its nature and behaviour. In the writer's own experience, even after removal and histological examination of a gland, the diagnosis may be uncertain, for the endotheliomatous picture is peculiar and may lead the pathologist to report 'granuloma, not tuberculous'—a mistake not likely to be repeated twice, but one which may occur sporadically with those who are not especially conversant with this regional tumour. The tumour, indeed, is an admirable example of what one may call a 'specific tumour', meaning a tumour specific to one particular region of the body, with a life-history, a spread, a symptomatology, and a histological character peculiar to itself. Diagnosis, treatment, and pathological understanding are all much simplified by the recognition of the specificity of certain tumours.

REFERENCES.—¹*Trans. Med. Soc. Lond.* 1911, 372; ²*Jour. Amer. Med. Assoc.* 1922, July 1, 10; ³*Brit. Jour. Surg.* 1929, Oct., 242.

NECK, CYSTIC TUMOURS IN. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

There are several varieties: (1) The congenital multilocular cysts, or cystic hygromata; (2) The unilocular cyst, or hydrocele of the neck; (3) Blood cysts; (4) Dermoid cysts; (5) Bursal cysts; and (6) True hydatid cysts.

Cystic hygroma is a cystic lymphangioma. The cysts are sometimes congenital in origin but may be acquired. They usually make their appearance shortly after birth. They arise most frequently in the neck, and are found beneath the deep fascia projecting either in front of or behind the sternomastoid muscle. Cystic lymphangiomas may be found in the groin, in the axilla, or in the floor of the mouth. They sometimes undergo spontaneous shrinkage and cure. Operative treatment often entails a deep dissection amongst the structures at the root of the neck. The cyst may extend into the anterior mediastinum. In young children operation should be avoided. The contents of the cyst, if unilocular, should be evacuated through a trocar and cannula, and the cyst injected with some sclerosing agent such as **Quinine and Urethane** or diluted **Tincture of Iodine**. Injection treatment fails in the multilocular varieties. As an alternative to excision in late cases the cyst may be opened and the edges sutured to the skin. The cavity is packed with gauze.

H. S. Souttar¹ states that in the treatment of cystic hygroma the best results are obtained by **Diathermy**, using a needle insulated almost up to the point and plunging it deeply into the tumour. Injection of **Boiling Water** might produce a similar result.

Plate XXXVII illustrates a tumour of the neck in an adult which was thought clinically to be lymphangiomatous. It moved freely as if encapsulated. A swelling had been present since childhood, but had grown more rapidly during the last twelve months. It did not transilluminate with the Cameron light. An exploring needle and syringe found blood only. At operation an encapsulated vascular tumour resembling a goitre macroscopically was removed after division of the capsule in the region of the deep structures of the neck. The pathological report was of much interest. The tumour was regarded as a malignant endothelioma originating in the cervical lymph-nodes. These tumours grow more slowly than the more malignant lymphosarcomata. They often are anteceded by a granulomatous process. One of the small attached lymph-nodes showed evidence of a tuberculous infection.

REFERENCE.—¹*Art of Surgery*, 372, London: William Heinemann.

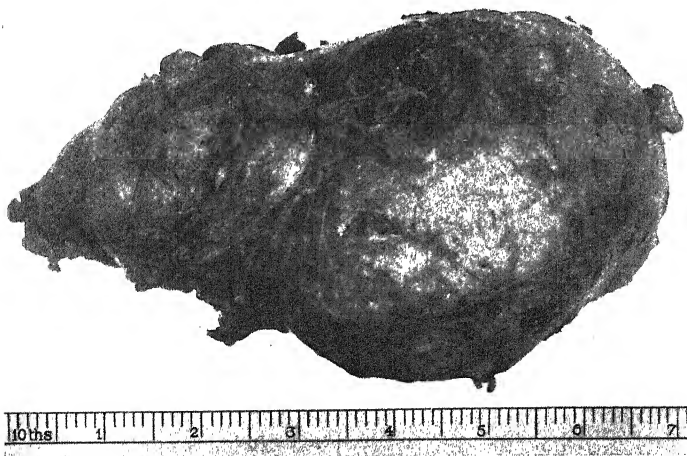
NEPHRITIS. (See RENAL DISEASE.)

PLATE XXXVII

MALIGNANT ENDOTHELIOMA OF THE NECK



A swelling had been noticed in infancy, and by adult life had increased to the size shown.



To illustrate the tumour after removal.

NEPHROPTOSIS. (*See* KIDNEY, SURGICAL AFFECTIONS OF.)

NEPHROSIS. (*See* RENAL DISEASE.)

NERVOUS SEQUELÆ OF TRAUMA. (*See* MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

NEURALGIA, TRIGEMINAL. (*See also* NASOPHARYNX, ENDOTHELIOMA OF.)

Geoffrey Jefferson, M.S., F.R.C.S.

Alcohol Injection into the Gasserian Ganglion.—Appalled, as they very well might have been, by the mortality attending radical operations on the Gasserian ganglion for neuralgia twenty years ago, many surgeons turned to alcohol injections. The results, though often imperfect, were at least non-fatal and gave sufficient encouragement for perseverance. The fairly rapid return of sensation and the old neuralgic pain after the peripheral injections of Schlösser led to a search for some method of injection which would give more permanent results. And so we arrived at the injection of the ganglion itself with which the names of two people are indissolubly bound up, Wilfred Harris in this country and Fritz Härtel in Germany. Harris showed that by using a slight modification of the ordinary technique for the injection of the third division alcohol could be made to permeate into the ganglion. Härtel's technique was something different, for, entering anteriorly through the face slightly above and behind the angle of the mouth, the needle was directed obliquely backwards and upwards to enter the foramen ovale. No definite measurements are possible for this injection, which requires practice on the cadaver. The entry of the needle into the foramen can be definitely felt; the point is introduced 1 cm. farther, and 1 c.c. of alcohol is very slowly injected (ten minutes). Härtel¹ in a most interesting communication has reviewed his own personal experiences with the method that he introduced. He prefers his own route to that used by Harris on the ground that no extracranial scarring due to tissue reaction produced by the alcohol follows his own method, for the injection is made into the *cavum Meckelii* only. It is therefore easier, if need be, to re-inject by the Härtel route than by the lateral or Harris route. Härtel divides his material into two groups: the German cases, 73 in number; and the Japanese, 98 (Härtel is now Professor at Osaka). He obtained total anæsthesia of the trigeminal field in 64.5 per cent of the former and 62 per cent of the latter, with cure in 68.5 per cent and 81 per cent respectively. The better results of the Japanese series he thinks are due to their being more recent, many not having had time for recurrence. He insists on the necessity for total anæsthesia of the side of the face if the pain is to be permanently stopped, and supports the statement with his figures; for with partial anæsthesia 65 per cent and 46 per cent respectively had a return of neuralgia. It is clear, therefore, that a single injection may not be so fortunate as to give a complete anæsthesia and cure, and further injections are needed, though he got the full result with one injection each in 96 cases out of the 171. But in 59 cases two injections, in 29 cases three, and in 8 cases four or more were required. He thinks that if four injections do not cure the patient it is useless to continue; very probably the diagnosis has been wrong (hysteria, pain due to lesions in the central grey matter, etc.). He has found that it is important to render the first division insensitive (ophthalmicus), and that recurrence will occur more certainly if this division is left free than would be the case if the third (or mandibularis) escaped. This conclusion is peculiar, for the result is by no means the same with operations on the root of the ganglion. It would appear that partial or 'fractional' sections (*see* MEDICAL ANNUAL, 1929, p. 313) are more successful than partial

injections. Frazier insists that he has never had a recurrence after a partial section of the sensory root which renders the face only partially insensitive, and my own experience is in full agreement with Frazier's. Nor have my own ganglion injections recurred yet when not entirely numbed.

The untoward results of injections chronicled by Härtel are of considerable interest. They are few, but, as the mass of his material proves, he has had opportunities of perfecting his technique denied to most, and it seems to us indisputable that the treatment of neuralgia should be segregated into the hands of the few who may be relied upon to perfect their technique, and so reduce the possibility of unlooked-for troubles. Vomiting sometimes occurs during the injection, a hæmatoma may form and be troublesome, herpes may break out, but none of these results are dire. Paralysis of the abducens with consequent diplopia occurred in 18 cases—rather more than 10 per cent—but it disappeared invariably within three months. There were 2 cases of facial paralysis, and these also recovered. Ulcer of the cornea is a more serious matter still, for it may easily develop into an opacity. In 47 German cases with full anæsthesia of the ophthalmic division corneal ulcer appeared in 10; 3 healed, but 7 were left with defective vision. In 70 Japanese with complete anæsthesia the cornea was affected 7 times only. Härtel concludes his painstaking and honest analysis with a discussion on the cause of death in the patients found to have died when 'followed-up'; two committed suicide, several died of apoplexy.

Maris Dagliotti,² in a short paper on the same subject (in which he fails to refer to Härtel), describes the Härtel technique, and says the results were perfect in all of 38 Italian cases. Härtel believes that it is wise to X-ray the base of the skull before operation, to see the shape, size, and position of the foramen ovale, and Dagliotti suggests an X-ray during the injection with needle *in situ* if the foramen cannot be found.

What are we to advise the neuralgic patient—operation or injection into the ganglion? Personally I use both methods, suiting them to the age and condition of the patient. If the patient is in good health apart from the neuralgia, open section of the root is more certain, and it is not necessary to divide the whole of it in most cases to ensure permanent relief. When old or debilitated persons come for treatment the injection should be chosen, but it must be taken seriously. The patients must be admitted to hospital and kept there for a few days if the best results are to be obtained.

REFERENCES.—¹*Arch. f. klin. Chir.* 1929, Oct., 374; ²*Med. Jour. and Record*, 1930, Feb., 141.

NEUROSYPHILIS. (*See DEMENTIA PARALYTICA; SYPHILIS; TABES DORSALIS.*)

NEW-BORN, HÆMOGLOBINURIA IN. *Reginald Miller, M.D., F.R.C.P.*

It is a curious fact that, although quite a number of examples of this condition have been recorded abroad, only one case has been published in the English literature before the appearance this year of the paper by Jean Smith.¹ It seems, therefore, well to pay attention to the disease here in spite of its rarity. The symptoms make their appearance within the first month of life, and most commonly within the first ten days. The most prominent symptom is the discoloration of the skin, which turns dusky or a dark-slate colour. This resembles more the colour of argyria than that of cardiac cyanosis, and is equally present all over the body, trunk, face, and extremities. Icterus is also present, staining the sclerotics. The liver is enlarged, and the spleen may or may not be palpable. The stools are loose and dark green in colour, and the urine is

dark brown from the presence of hæmoglobin. The infant grows very lethargic, and in the great majority of the cases dies, usually within a few days. As to the cause of the disease, the fact that it can occur in epidemics seems to confirm what clinical study of an individual case suggests—namely, that it is an infective condition. It has been held that the infecting micro-organism is the *B. coli*, but the author of the present paper states that it is “probably more correct to say that any pathogenic organism, providing the infection is sufficiently virulent, can cause hæmoglobinuria in the new-born”. Although von Winckel was probably not the first to describe the disease, his description of it has led to its being called after him.

REFERENCE.—¹*Arch. of Dis. Child.* 1930, v, 275.

NIPPLE, PAGET'S DISEASE OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

J. J. Eller and N. P. Anderson¹ state that they concur in the opinion of those who believe that Paget's disease of the nipple is a true cancer from the beginning; that the Paget cells found in the epidermis are true cancer cells, identical in appearance with the intraduct cancer cells. They are also inclined to believe with Masson and Pautrier that Paget's disease of the nipple is an epithelioma that has arisen in the first milk-ducts near their mouths. Finally, they too are strongly of the opinion that Paget's disease should never be considered a precancerous lesion, but always a carcinoma of the nipple, symptomatic of a deeper carcinoma of the breast, and that early and total removal of the mammary gland is always indicated.

Sir G. Lenthal Cheatle,² discussing the treatment of mammary carcinoma by radiation, comes to the following conclusions. The evidence revealed by the systematic examination of whole microscopical sections made from the underlying breast in Paget's disease of the nipple proves that carcinoma can be present in breasts without causing a lump or any sign of its presence, and without any axillary lymphatic glandular involvement. A proportion of breasts underlying Paget's disease of the nipple contain no carcinoma, but, so far as his experience goes, they all somewhere contain a dangerous-looking epithelial neoplasm, sometimes in a large duct and at other times in distended terminal ducts and acini in two or more parts of the breast. The only wise plan is to subject the whole of all breasts suffering from Paget's disease to **Interstitial Radiation** if they are to be radiated at all. He is speaking of the treatment of the underlying breast only in Paget's disease, and says he does not know whether the cutaneous disease is affected by radiation. External radiation by means of X rays was unsuccessful in one of his cases.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, May 25, 1653; ²*Brit. Med. Jour.* 1930, i, 807.

NOSE, DISEASES OF. (*See also* NASAL SINUSES.)

A. J. M. Wright, M.B., F.R.C.S.

Nasal Deformity.—Great advances have been made during and since the War in the plastic surgery of nasal deformities, whether resulting from injury or disease. Although methods differ, certain general principles are gradually becoming established. M. Metzenbaum,¹ in considering deformities resulting from injury, advises that the arches of the nose should first of all be as far as possible reconstructed by replacing the bones and cartilage in their former anatomical relations. If this is done, a graft may be unnecessary, or, if used, it can be smaller than would have otherwise been the case. Most important of all, the resulting reconstructed nose will have a more natural appearance than if the graft had been placed upon a broad and flattened base. J. N. Roy²

has dealt broadly with the method of correcting hump nose (*Plate XXXVIII*). The first stage should be the correction of deviation of the septum or other intranasal abnormality. In dealing with the hump, in addition to removing the prominent portions of the nasal bones, it may also be necessary to deal with the ascending process of the superior maxilla. Of the various methods of approach which have been suggested, he favours, for this deformity, an endo-nasal incision made from the two sides in the neighbourhood of the lower border of the quadrangular cartilage. Skin and periosteum are elevated over the whole length of the median line and the hump can be removed with a double-bevelled chisel. When necessary, the ascending process of the superior maxilla can be divided endonasally on either side with a saw, thus narrowing the bridge of the nose. No sutures are needed, but some external splint is advisable.

H. L. Updegraff,³ in a profusely illustrated article, has dealt with the repair of cases of loss of the greater part of the nose by means of a forehead flap, but the detail is too complicated to be given here.

Nasal Septum.—

Operation.—Operations on the nasal septum are now so frequently performed that the consideration of possible complications of the operation is worth while. The majority of operators are agreed that if an extensive submucous resection is carried out in the growing child, there is some risk of deformity from undergrowth eventually developing. The problem, therefore, is to decide whether to leave the obstruction or to employ some modified operation. W. W. Carter⁴ stresses the importance of leaving the anterior edge of the septum as a prop to the tip of the nose, and of not displacing the upper edge of the cartilaginous septum from between the lateral cartilages, since it constitutes the keystone of the arch. The method he has evolved consists in first elevating the mucoperichondrium from the convexity of the deflection and then in cutting out a narrow strip of cartilage from before backwards through the apex of the deflection. Two further incisions are made through the skeleton of the septum above and below the deflection and parallel to the long axis of the strip which has been removed. These incisions destroy the resiliency of the cartilage and enable the upper and lower portions, which are still attached to the perichondrium on the concave side, to be forced into the mid-line. They are kept in place by a gold-wire splint, which should remain in the nose for at least ten days.

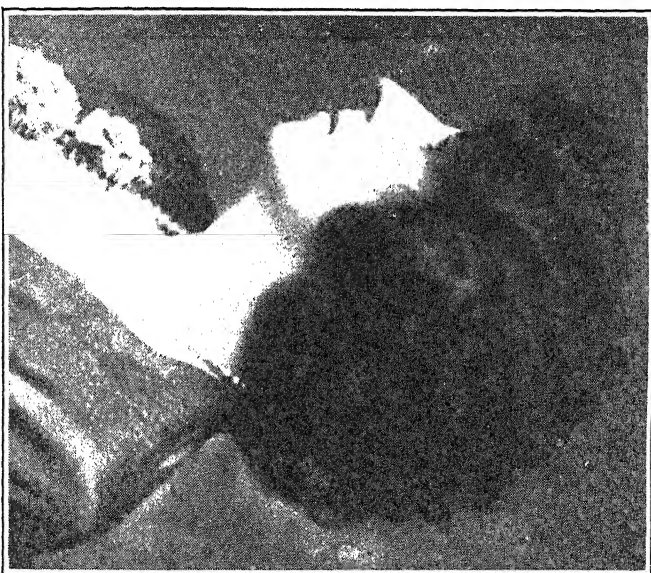
G. Claus⁵ mentions three possible complications of septal operation. In one instance a cyst containing clear yellow fluid was found in the septum in a case of injury thirty years previously, the cyst presumably resulting from a septal hæmatoma; in the second case an abscess of the hard palate developed as a result of injury in removing the lower portion of the bony septum; and in the third erysipelas started in the incision and spread up over the cheek and scalp. The commonest complication is probably an abscess which develops between the flaps and is usually the result of infection taking place in a collection of blood. Some form of splinting which will keep the flaps in close contact after the operation does help to prevent such a complication. Should a hæmatoma or abscess occur, it should be drained at the earliest possible moment to prevent a subsequent sinking in of the cartilaginous bridge. The best method of draining such a collection of blood or pus is that mentioned under hæmatoma of the auricle (*see EAR, DISEASES OF*).

Perforation in Chromium Workers.—It has been known for many years that workers in chromium preparations were liable to ulceration with perforation of the septum, and the greatly increased use of chromium for plating has made this complaint of some importance. F. W. Dixon⁶ has investigated a series of eighteen cases, all found in one factory in which the ventilation was poor and in which chromic acid was the preparation employed. In other establish-

PLATE XXXVIII—TREATMENT OF NASAL DEFORMITY
(J. N. BOY)



Fig. A.—Patient with hump nose.



*Fig. B.—Appearance of patient after operation.
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ments in which the same process was employed, but in which ventilation was adequate, septal ulceration did not occur. He concludes that such premises should have forced ventilation to remove the chromic-acid spray from the atmosphere. He found that the ulceration was painless, neither disabling nor disfiguring, that bleeding was slight, but inconvenience was caused through crust formation, and, where the perforation was small, whistling during expiration was noted. The free use of **Petrolatum** will prevent such crusting, and whistling can be cured by enlarging the perforation.

Turbinal Hypertrophy.—As an alternative to the galvanocautery or removal of a portion of enlarged inferior turbinals, J. C. Beck⁷ has used the **Diathermy** needle with success. He uses a special electrode consisting of a Hagedorn needle insulated except for about 2 mm. at the point. Under local anaesthesia the needle is passed along the whole length of the turbinal in close contact with the bone. The coagulation current is then turned on and the needle slowly withdrawn, the current being cut off just before the electrode emerges. It is wise to test the current on a piece of meat, using such a strength as will blanch an area of 2 mm. diameter.

Diastolization.—A mechanical method of treating hypertrophic rhinitis, and bearing the above title, was introduced by Gautier some four years ago, and A. G. Wells⁸ now reports favourably on the method as a result of experience in Board Clinics in London. The method consists in gentle dilatation of the nasal passages combined with massage of the mucosa by means of hollow india-rubber bougies which, after sterilization and lubrication, are passed into the nasal cavities and alternately inflated and allowed to collapse by pressure on a rubber bulb, while at the same time the bougie is given a to-and-fro motion. At each sitting the size of bougie is increased.

Vasomotor Rhinitis or Spasmodic Rhinorrhoea.—Under the latter title W. M. Mollison⁹ has given his experience in the drug treatment of these cases, which are characterized by attacks of sneezing and watery discharge. Having had some success with the administration of thyroid extract, he then tried **Calcium and Parathyroid**. Of 40 cases so treated, 65 per cent were either cured or improved. The calcium was given in one or other of the following forms: lactate, kalzana, tricalcine, and collosol calcium, together with parathyroid extract. The dose is 15 gr. of the calcium and $\frac{1}{10}$ gr. of parathyroid extract; or if collosol calcium is used, 1 drachm twice daily. **Thyroid Extract**, if used, should be given in doses of $\frac{1}{2}$ gr. twice a day. In two cases **Quinine** was given when hyperthyroidism was suspected. Obvious mechanical abnormalities or infections in the nose should receive appropriate attention before starting the treatment.

Nasal Polypi.—

Type of Operation.—An attempt has been made by V. B. Tulloch¹⁰ to decide between the relative merits of the two types of operation for the treatment of nasal polypi. The operations under review were: (1) The older method, consisting in the removal of the polypi with a snare, together with a limited opening up of the anterior and posterior ethmoidal cells with punch forceps; and (2) The more recently introduced operation, of which Sluder's is a type, in which an effort is made to remove the whole of the middle turbinal and completely to exenterate the ethmoidal labyrinth. For this purpose, some 400 cases which had been operated on by one method or the other were re-examined, with the following results: As regards freedom from recurrence of the polypi after operation, there is no perceptible difference between the two procedures. In regard to mortality, however, the difference is marked, the mortality of the older operation being 0.64 per cent, and of the Sluder operation 3 per cent, or nearly five times as great.

Asthma and the Nose.—It can be accepted that nasal infections with polypi or hypertrophic changes are met with in a large proportion of cases of asthma. It can also be accepted that the operative treatment of these nasal lesions may have a beneficial effect on the asthma, may have no apparent effect at all, or may even make it worse. J. Dundas-Grant,¹¹ in a general review of the nasal factor in the treatment of asthma, pleads for the careful examination and surgical treatment of nasal lesions in the asthmatic. In a consecutive series of 15 private cases, in 9 the asthma was cured by the intra-nasal treatment, great improvement resulted in 3, and some relief in one other case. As a local application to the nasal mucosa, he favours an ointment containing **Anæsthesin and Adrenalin**. F. Smith¹² considers that a very large percentage of cases of asthma depend on chronic nasal sinus infection, particularly of the ethmoid. He considers that such sinus disease may coexist in any given case with an allergic reaction as a cause of the asthma. In his opinion the sinus disease is frequently undiagnosed in such cases, X-ray examination combined with the injection of lipiodol into the sinuses revealing gross hyperplastic changes in the lining of the sinuses. He considers that intranasal surgery in the treatment of asthma has been partially discarded owing to its not having been sufficiently radical.

A more conservative view as to the place of nasal surgery in the treatment of asthma is given by H. Bourgeois.¹³ He considers that a systemic defect is the fundamental factor, and as far as nasal conditions are concerned, he regards intranasal pressure effects as reflexly aggravating the condition, and therefore advocates the mere removal of mechanical obstruction.

Epistaxis.—A résumé of the pathology of epistaxis as given by G. V. T. Borries¹⁴ is as follows: The most frequent cause of nose-bleeding is rupture of vessels in Kieselbach's area—anterior dry rhinitis, excoriation, blood crusts, ulcer, telangiectases, and perforation. This is the most frequent type of septal perforation; and such a small perforation in this area, that only involves the cartilaginous part of the septum, is never syphilitic, but either the result of an anterior dry rhinitis or of a tuberculous process. In traumatic nose-bleedings two things should be kept in mind: (1) That a fracture of the nose calls for a reduction of the fracture, and that the external swelling as a rule will make it impossible to decide whether any disfigurement of the nose will result; (2) That a septal hæmatoma ('half a cherry' in each nostril) requires immediate operation. Among infectious diseases, nose-bleeding is particularly frequent in typhoid fever, influenza, and small-pox. Sanguineous purulent coryza is present in cases of foreign bodies, diphtheria, and congenital syphilis of infancy. Every persistent coryza in a poorly-nourished infant, especially when the secretion is blood-tinged, is suspicious of congenital syphilis. In diseases of the nose, severe spontaneous nose-bleedings are most often due to nasopharyngeal fibroma, ozena, or tumours. Spontaneous unilateral epistaxis in an elderly individual, especially with concurrent unilateral blocking of the nasal passage, is strongly suggestive of a malignant tumour. In disease outside the nose the greatest importance is attached to chronic nephritis, arteriosclerosis, heart lesions, and various diseases of the blood—leukæmias, anæmias, hæmorrhagic diatheses, etc.

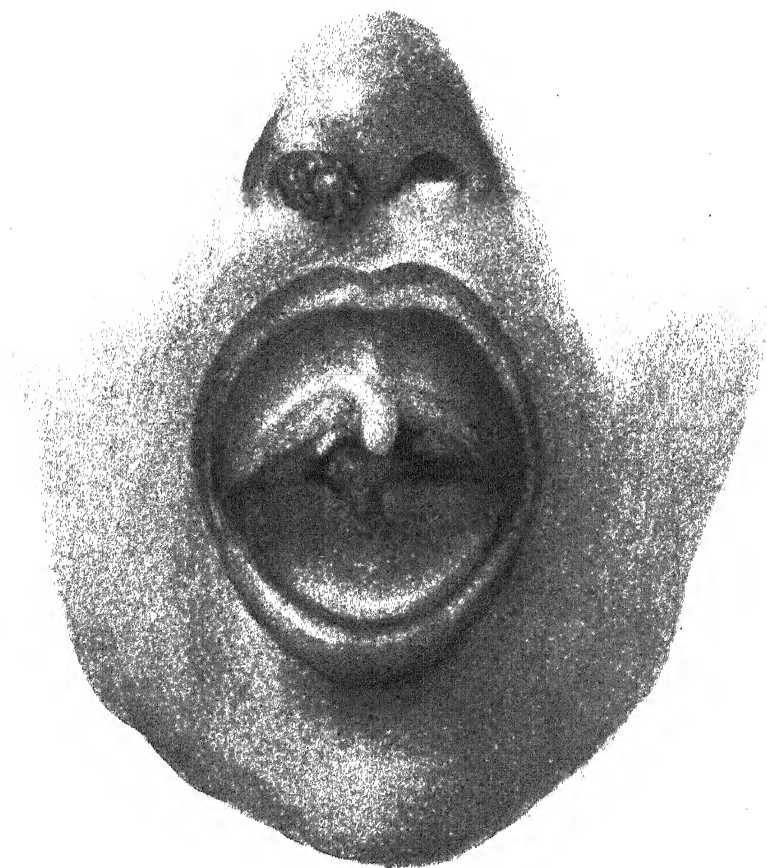
TREATMENT.—[In the treatment of epistaxis, where a plug is necessary, a gauze-filled rubber glove finger has the advantage of being easily inserted and withdrawn, of exerting a constant elastic pressure, and of not becoming offensive. In ordinary cases such a plug may, if necessary, be left in for two or three days.—A. J. M. W.]

Treatment with Radium.—It has been known for many years that radium is effective in causing the disappearance of cutaneous nævi by its selective action

PLATE XXXIX

RHINOSPORIDOSIS

(P. V. CHERIAN and A. VASUDEVAN)



Case of rhinosporidiosis in a female.

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on the dilated capillaries. Epistaxis is most commonly associated with a nævoid condition of the vessels on the anterior portion of the nasal septum. J. C. Seal¹⁵ has treated more than 100 cases of epistaxis by the application of radium intranasally. The treatment consisted in the application of 25 mgrm. of radium, screened with an unmentioned thickness of platinum, for two periods of four hours at intervals of a fortnight. The result was a disappearance of the dilated capillaries with freedom from further hæmorrhage. [Whilst this method may be useful for cases in which the galvanocautery is unsuccessful, the expense and possible risk involved would seem to make it unnecessary as a routine.—A. J. M. W.]

Rhinoporioidosis.—This is a rare protozoal disease, usually involving the intranasal structures and characterized by polypoid tumour formations. The condition was very thoroughly dealt with by J. H. Ashworth and A. Logan Turner,¹⁶ as the result of a study of a case occurring in a medical student at Edinburgh who was a native of India. Cases have also been described from time to time from various parts of the world, but the condition seems to be much the most commonly met with in India. F. H. B. Norrie¹⁷ gives a clinical review of the condition as the result of the study of five cases met with in Calcutta. The disease seems to appear at any age, is most frequently met with in men, and no cases have been described in Europeans. The complaint is a chronic one, the symptoms produced consisting of nasal obstruction with a watery discharge in which the characteristic spores are present. The local lesion consists of sessile or pedunculated, single or multiple, and frequently fringed, polypoid masses, arising from the septum or turbinals, but never apparently involving the accessory sinuses. Removal of the tumour masses usually gives satisfactory results, although with multiple tumours recurrences are not uncommon. P. V. Cherian and A. Vasudevan¹⁸ describe a case occurring in a woman (*Plate XXXIX*). The tumour had been operated on ten times during the last fifteen years, but always recurred. It blocked the right nostril, was reddish in colour, and sporangial spots were visible on its surface. The extension of the growth was visible behind the soft palate.

REFERENCES.—¹*Laryngoscope*, 1930, July, 488; ²*Jour. Laryngol. and Otol.* 1930, June, 398; ³*Ann. of Surg.* 1929, Dec., 961; ⁴*Ann. Otol. Rhinol. and Laryngol.* 1930, March, 199; ⁵*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* 1929, Sept. 10, 444; ⁶*Jour. Amer. Med. Assoc.* 1929, Sept. 14, 837; ⁷*Ann. Otol. Rhinol. and Laryngol.* 1930, June, 349; ⁸*Metropolitan Asylums Board, Annual Report*, 1928-9, 369; ⁹*Brit. Med. Jour.* 1929, ii, 1052; ¹⁰*Jour. Laryngol. and Otol.* 1929, Sept., 593; ¹¹*Practitioner*, 1929, July, 18; ¹²*Ann. Otol. Rhinol. and Laryngol.* 1929, Dec., 1095; ¹³*Ann. des Mal. de l'Oreille*, 1929, June, 656; ¹⁴*Jour. Laryngol. and Otol.* 1930, Feb., 81; ¹⁵*Laryngoscope*, 1930, April, 271; ¹⁶*Jour. Laryngol. and Otol.* 1923, June, 285; ¹⁷*Ibid.* 1929, Aug., 505; ¹⁸*Ibid.* 518.

NURSING HOMES, INSPECTION AND REGISTRATION OF.

G. E. Oates, M.D., M.R.C.P., D.P.H.

The Nursing Homes Registration Act, 1927, has made it illegal to provide a nursing home, for either medical, surgical, or maternity cases, unless it has been registered. The Act has been in force long enough to make it apparent that the standards of accommodation are being improved and certain undesirable nursing homes are becoming eliminated. The definition of a nursing home under the Act is comprehensive—namely, any premises used or intended to be used for the reception and/or the providing of nursing for persons suffering from any sickness, injury, or any infirmity, and including a maternity home or hostel for expectant mothers. Not only convalescent homes, but any places where infirm persons are tended come within the definition. Certain institutions are expressly excluded from supervision; for instance, those maintained or controlled by a Government Department or a Local Authority, as well as lunatic asylums. Hospitals and institutions not carried on for

profit may be granted exemption. Christian Science nursing homes, provided they are known as such, may be exempted by the Minister of Health.

Medical practitioners who take in private patients, whether invalid or infirm, who require nursing must be registered in respect of their premises. Some doubt may arise when a lunatic 'in single care' or a mental defective 'in private guardianship' is taken in a doctor's house. Since all these cases are visited by officers of the Board of Control, and little in the way of 'nursing' may be necessary, many Local Authorities do not insist on registration in such cases. Any medical practitioner who proposes to take in a patient of this kind should consult the Public Health Authorities as to the need for registration. The registration of a nursing home cannot be refused except for a proper reason, such as that the applicant or a member of his staff is not a fit person to carry on, or be employed in, the nursing home, owing to age or otherwise. It is also possible to refuse to register an applicant on the grounds that the situation, construction, accommodation, staffing, or equipment of the nursing home is not fit for the purpose, or that the home is used in a way which is improper or undesirable. The fact that there is a garage below, with danger from fire, would, for instance, be a valid objection to registration.

As regards accommodation, many authorities insist on fixing the number and type of cases which may be taken into each room of a nursing home. Care is also taken that the different types of case are not mixed to the possible detriment of the patients. For instance, no other beds except maternity beds should be in a maternity ward, and it is undesirable that mental or inebriate patients should be accommodated in the same building as maternity cases. It is difficult for the authority to lay down rules for the staffing of a nursing home. The London County Council, for an ordinary nursing home, requires two day nurses and one night nurse for every six patients, and one nurse on night duty for every four patients or for any one patient who is acutely ill.

The Act lays down certain minimum requirements as regards trained staff. In the case of a newly established nursing home (other than a maternity home) it must be under the charge of a person who is either a medical practitioner or a trained nurse, and who is resident in the home, and there must be as well a proper proportion of qualified nurses amongst the persons having the superintendence of or employed in the nursing of the patients. In the case of an old-established home, the nursing must be under the superintendence of a qualified resident nurse. In newly established maternity homes, the person who has the superintendence must be either a qualified nurse or a certified midwife, and any person employed in attending any woman in childbirth in the home or in nursing any patient in the home should be a medical practitioner, a certified midwife, a pupil midwife, or a qualified nurse.

The by-laws which have been made by the various authorities prescribe the records which are to be kept of the patients which are received into a nursing home. Notes must be made of any infectious disease or abnormal condition which might interest the authority, but the clinical notes of a patient's condition and progress are not open to inspection by the Local Authority. Case records must, however, be kept of the patients—that is, daily and periodical statements of their health. The date and hour of any miscarriage occurring in the home must be noted. Any transaction for the placing-out of a foster-child from the home, in which the keeper is concerned, must be plainly recorded. Proper receipts must be given for payments made in respect of patients, and duplicates kept. This requirement is stated to have had a good effect in preventing the disputes which frequently arose between keepers and patients concerning fees.

OBESITY. (*See PHARMACOLOGY AND GENERAL THERAPEUTICS.*)

ŒSOPHAGUS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Cardiospasm.—The results of his researches, which had been carried out over many years, were given by H. P. Mosher¹ in the Semon Lecture. His investigations concerned themselves with the various anatomical and pathological conditions found at the lower end of the œsophagus in infants and adults, and with the light which they seem to throw on the nature of cardiospasm. He states that, as the result of infection transferred from adjacent glands, the various components of the œsophageal wall at its lower end may show at birth a localized or generalized hypertrophy. Infection may also be found in the form of an ulcer of the œsophagus at or before birth, while small patches resulting from ulceration may be found in the lower end of the œsophagus or fundus of the stomach. In addition, inflammatory adhesions round the lower end of the œsophagus may produce distortion. Twenty-five cases of cardiospasm have shown a crease in the œsophageal wall at the level of the crura of the diaphragm, which Mosher believes to be due to a fibrosis of the connective tissue surrounding the œsophagus in this region resulting from infection transferred from neighbouring organs.

TREATMENT.—The author employs **Dilatation** with an inflatable bag under manometer control, the bag having barium implanted in four strips in its wall, so that the dilatation can be carried out under direct observation with the X-ray screen.

Carcinoma of the Œsophagus.—

Radium Treatment.—The treatment of carcinoma of the œsophagus with radium is being attacked from different angles—unfortunately without producing satisfactory results up to the present. In its original stages radium was employed in a single large dose inserted into the lumen of the stricture and maintained in position by a wire stylet for relatively short periods. A theoretical improvement on this method was the employment of a smaller dose, adequately screened and placed round an intubation tube, thus permitting a more prolonged radiation. The results produced, however, seem to show that carcinoma of the œsophagus is relatively radioresistant, and that a still more uniform radiation is required. F. J. Cleminson² has attacked the problem by exposing the œsophagus through the pleural cavity. The lung was collapsed eight days before the operation, which was carried out on the side on which the growth seemed to be most pronounced as shown by œsophagoscopy. It was found difficult to localize the growth by palpation without the presence of a bougie in the œsophagus. In the earlier cases unscreened radon seeds were embedded round the growth, but owing to evidence of sloughing of the surrounding structures a platinum screen was subsequently employed. A dose of from 12 to 20 seeds containing 1 to 1.2 mc. was used. Since it is only possible to radiate about two-thirds of the circumference from one pleural cavity, a further dose of radon attached to a Souttar's tube was employed in the lumen to radiate the remainder. A total of four cases was treated, the three earlier ones proving fatal, and the last one having been operated on too recently to judge of the result. As a result of Cleminson's experience, it may be said that it is not a very difficult or dangerous proceeding to expose the thoracic œsophagus through the pleura after collapse of the lung. On the other hand, it is difficult actually to localize the growth when so exposed, and the use of radon introduces a risk of sloughing. Histological examination confirms the fact that œsophageal carcinoma is relatively radioresistant.

An alternative method has been employed by Musgrave Woodman³ in this country and by Muir, of New York. Woodman inserts radon seeds into the

substance of the growth through the œsophagoscope by means of special cannulæ with stylets of different lengths and straight or with a curve at the distal end (*Fig. 43*). Five seeds are inserted as an initial dose, and after some weeks, when the upper portion of the growth has shrunk, further seeds are inserted at a lower level (*Plates XL, XLI*). Thirty-five cases have been treated,

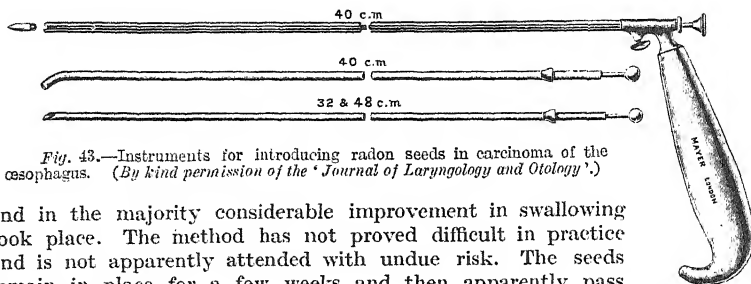


Fig. 43.—Instruments for introducing radon seeds in carcinoma of the œsophagus. (By kind permission of the *Journal of Laryngology and Otology*.)

and in the majority considerable improvement in swallowing took place. The method has not proved difficult in practice and is not apparently attended with undue risk. The seeds remain in place for a few weeks and then apparently pass into the lumen.

Removal by External Operation.—Attempts are still being made to remove growths from the thoracic œsophagus by external operation. F. Torek,⁴ who has had one of the few successful cases sixteen years ago, has considered the reasons for the general lack of success, the percentage of failures being over 90. He points out that experimental operations in animals are very much more successful, and considers that the lack of success is largely due to the late stage at which the disease is first seen with the resulting poor general condition of the patient. He considers that operation should only be carried out in those whose general condition is relatively good, and that, if operation is decided on, it should be carried out as soon as possible. The operation of exposure should be considered as an exploratory one and should not necessarily be followed by an attempt at removal. C. Eggers,⁵ who also had one successful case, now reports another in which the patient has recovered from the operation and is feeding by means of a rubber tube from the lower end of the cervical œsophagus to the gastrostomy wound. She has, however, some malignant infection of the glands at the root of the neck, so that the case cannot be considered as entirely successful.

Intubation.—The flexible metal tube introduced by Souttar is now widely employed where intubation of the stricture is considered advisable. C. Yates⁶ has devised a simple technique for the introduction of these tubes. He considers that only the smaller sizes should be employed, the larger ones being accompanied by a risk of rupture of the œsophagus during their insertion. The method consists essentially in employing a conical gum-elastic tip about three inches long, the base of which fits into the lower end of the Souttar's tube. The tube, with conical tip in position, is introduced, mounted on a special cannula with stylet, the distal end of the latter carrying a plug of wool. When the tube is in position in the stricture, the tip is displaced by the stylet and passes onwards into the stomach.

Esophagitis.—A very important position in the pathology of œsophageal disease is allotted by J. Guizez⁷ to inflammatory conditions of its walls. He divides cases of œsophagitis into: (1) *Secondary* ones, in which the inflammatory condition is due to the irritation and decomposition of retained food associated with a stricture; and (2) *Primary* cases. The improvement in swallowing met with in cases of stricture as a result of gastrostomy or lavage of the œsophagus is to be explained by the relief of the inflammatory element.

PLATE XI.

CARCINOMA OF ESOPHAGUS

(MUSGRAVE WOODMAN)



Fig. A.—Illustrating stricture 9 in. from teeth, with four rubber tubes inserted symmetrically.

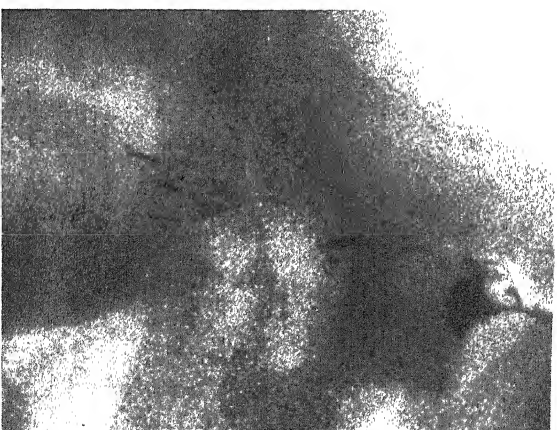


Fig. B.—Growth in upper thoracic region of esophagus, showing seven rubber seeds in position.

PLATE XII

CANCER OF ŒSOPHAGUS—*continued*
(HUSGRAVE WOODMAN)

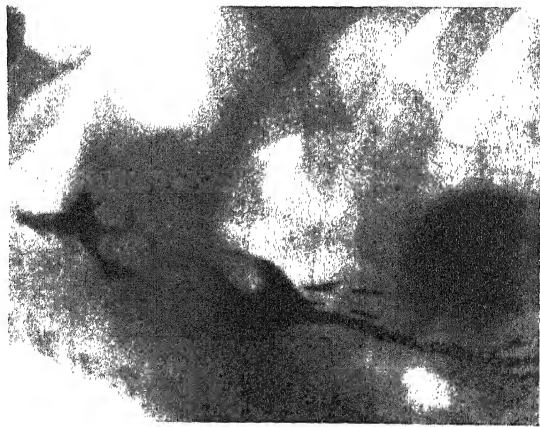


Fig. C.—Same case as *Fig. B*, showing a further five radon seeds inserted.

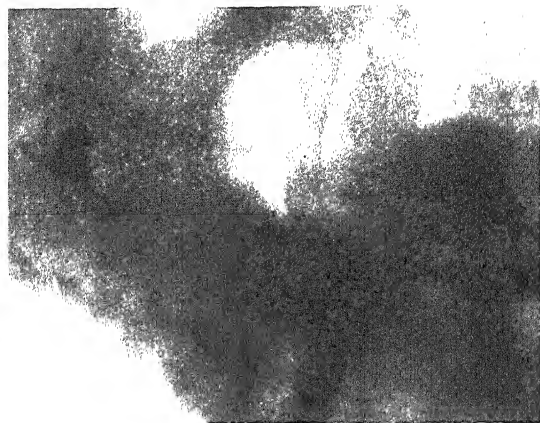


Fig. D.—Same case as *Figs. B* and *C*, showing thick bismuth paste passing through the strictured area.

He regards primary œsophagitis as being the most important factor in the causation of spasm of the upper or lower end, as an occasional cause of simple stricture, and as a probable factor in the etiology of carcinoma. Primary œsophagitis is due to the swallowing of irritants, such as unmaasticated food, alcohol, etc. It is characterized by pain and deep tenderness high up in the epigastrium, with a feeling of soreness running up to the neck. The pain is intermittent, occurring between meals, and frequently relieved by the taking of solids or liquids. The spasm at the lower end associated with the inflammation tends to produce a hold-up of the food and thus further to increase the irritation. Examination shows a furred tongue and a markedly injected œsophageal mucosa, or, in old-standing cases, a mucosa that is sodden and grey, with perhaps patches of leukoplakia.

TREATMENT.—Cases of secondary œsophagitis should be treated by washing out the œsophagus with **Alkalis** two or three times a day with an ordinary stomach-tube. Such treatment may make a previously impassable stricture permeable. In cases of primary œsophagitis the cause should be searched out and dealt with—that is, teeth put in order, and the patient either placed on semi-solid diet or persuaded to masticate thoroughly. Alcohol should be forbidden, and alkaline drinks should be taken between meals.

REFERENCES.—¹*Jour. Laryngol. and Otol.* 1930, March, 161; ²*Ibid.* 1929, Sept., 577; ³*Ibid.* 584; ⁴*Ann. of Surg.* 1929, Oct., 496; ⁵*Surg. Gynecol. and Obst.* 1930, March, 630; ⁶*Brit. Med. Jour.* 1930, i, 440; ⁷*Presse méd.* 1929, Nov. 30, 1558.

ŒSOPHAGUS, FOREIGN BODIES IN. (See FOREIGN BODIES IN ŒSOPHAGUS AND BRONCHIL.)

ORAL SURGERY.

L. E. Claremont, M.D.S., M.R.C.S., L.R.C.P.

Fractures and Bone-grafting of the Mandible.—Surgeons as a rule show little direct interest in fractures of the lower jaw, and the principles that should govern the fixation of these injuries do not always appear to be fully appreciated. In the mandible more accurate restoration of the parts is essential than in other bones, because the slightest deviation will produce mal-occlusion of the teeth and interfere with mastication. Sometimes in a case of difficult reduction the surgeon may be tempted to wire or plate the fragments. The procedure invites osteomyelitis with sequestrum formation and great delay in union, as nearly all mandibular fractures are compound and constantly bathed in oral secretions. The wiring or plating method would only appear to be justifiable in an endentulous patient where the oral mucous membrane has not been broken.

Some form of interdental splinting is one of the best methods of fixation, but these splints take time to construct and need to be handled by an expert, as very accurate technique is necessary. Occasionally the splint is found to be impossible to fit on, and has to be remade or altered in the workroom; thus more valuable time is lost. In order to obviate these objections and difficulties, R. H. Ivy, of Philadelphia, strongly recommends ligation of the upper and lower teeth where present, thus reducing and fixing the fracture the first time the patient is seen. The case may be carried to completion by this method, or the wires may temporarily suffice until a splint can be made and inserted. The following are the requirements for the operation: Wire—22 or 23 gauge copper, or Angle's brass 24 to 26 gauge; instruments—pair of hæmostatic forceps, a pair of short-nosed scissors, a tenaculum or Backhaus towel-clamp. The technique for wiring (*Plate XLII*) is as follows:—

Take a six-inch length of wire and fold, twisting a loop in the form of an islet. Select the teeth to be wired. Insert both ends of eyelet wire from the

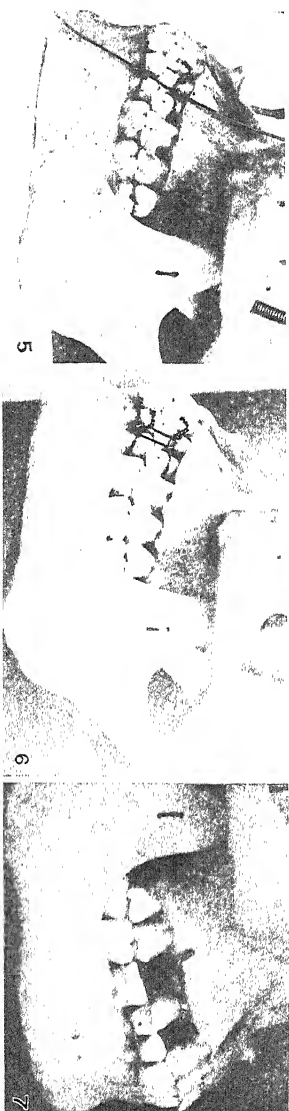
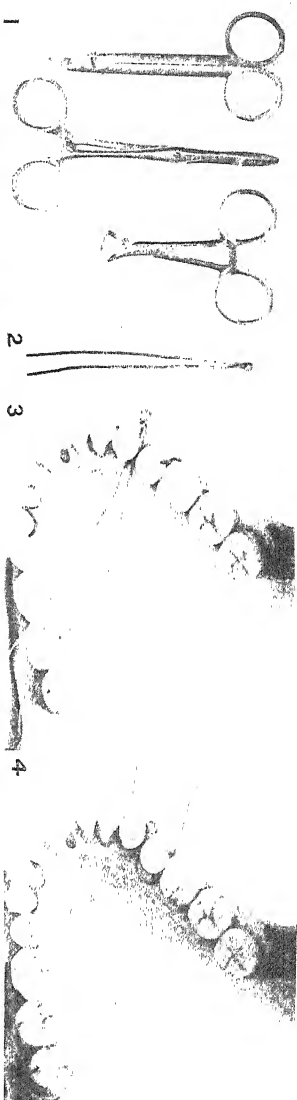
buccal surface through the interproximal space. Draw one end round the anterior tooth, and the other round the posterior tooth on to the buccal aspect. When upper and lower teeth have been treated in this way, in the case of the lowers the ends of the wire are twisted together with the cyclet projecting below the twist, in the case of the uppers above the twist. The ends are cut off and bent in to avoid injuring the cheek or gum. Teeth are treated similarly on the other side of the mouth. The upper and lower islets are connected together by passing a connecting or tie wire through them. The teeth are brought into occlusion, the ends of the connecting rods are twisted together, cut off short, and turned in.

When trauma is so severe, or from some other cause there is definite loss of part of the bone, a graft may be necessary. The mandible is very intolerant of foreign bodies, and attempts to fix a free graft by wire, pegs, or plates usually ends in failure. Fixation of the graft by dovetailing between the fragments or by dental splints at the time of the operation is equally disappointing. W. Billington and H. Round, of Birmingham, after trying various methods, have achieved their best results using dental splints some three weeks after the graft has been introduced and the wound firmly healed. In a recent paper read before the Royal Society of Medicine, they state that pedicle grafts have a very limited application, the fragment from which the graft is taken is weakened and there is greater interference with the teeth. After experimenting with grafts taken from various parts their final choice is the crest of the ilium.

All sepsis should be removed and an interval of several months should elapse after inflammation has subsided and the wound healed. A curved incision is made through the skin of the neck and carried an inch beyond the end of the anterior and posterior fragments. It commences and finishes about half an inch above the line of the lower border of the jaw, and in the neck it runs about an inch below the line. The ends of the fragments are fully exposed, the soft tissues covering the outer surface of each fragment being raised for an inch away from the gap and turned up in the flap. The intervening fibrous tissue is removed. Great care is required to avoid opening into the mouth. An accident of this sort means abandoning the operation and waiting until the wound has healed. A flake of bone is next removed from the outer surface of each fragment for an inch away from the gap. The graft is taken from the same side of the body as the wound in the face. It is trimmed and bevelled and made to fit comfortably so that the bevelled ends overlap the gap by an inch at either end and lie on the prepared raw surfaces on the fragments. The soft tissues are sewn closely over the graft with chromicized catgut. Finally the skin is approximated. After three or four weeks, if the condition is satisfactory, metal-cap splints with vulcanite extensions are made and cemented to any standing teeth. The extensions are lined with soft rubber where covering edentulous parts in the neighbourhood of the graft. Any slight alteration in the occlusion or displacement of the fragments resulting from the operation is easily reducible, the splints being fixed to each other with articulating tubes and bolts.

Operative Procedures on Dental Cysts (Cesare Cavina, Rome).—It has been long recognized that the post-operative treatment of large maxillary cysts is frequently tedious. Partsch placed the operative procedures on a scientific basis. Other eminent surgeons have modified his work from time to time. The Dupuytren-Heath-Partsch operation aims at transforming the cyst cavity into an accessory cavity of the mouth. The inauguration of the methods which are called rhinological, endonasal, or bucconasal—in which the cystic cavity drains by the nasal route, is transformed into an accessory

PLATE XIII.—ORAL SURGERY: FIXATION IN FRACTURES OF MANDIBLE (R. IL. IV)



1. Instruments required for manipulating wire: towel clamp, hemostatic forceps, and short-nosed scissors.
2. Wire twisted to form eyelet.
3. Ends of eyelet wire inserted between premolar teeth.
4. Ends of eyelet wire carried around premolar teeth back to buccal surface.
5. Eyelet wires attached to upper and lower premolar teeth. Connecting wire passed through eyelets.
6. Upper and lower teeth fixed in occlusion by connecting wire passed through eyelets.
7. Eyelet wire attached to single tooth in upper jaw.



cavity of the nose, is made to communicate with the antrum or nasal fossa, or, after extirpation of the cyst, the residual bony cavity of the nose is drained—has realized its greatest progress in the treatment of the large cysts of the maxilla. They alone conform to the ideals and principles of modern surgery, allowing the immediate closure of the operative wound, and in minimum post-operative time. The advent of the rhinological method has crowned the work of Partsch, bringing about a rapid cure, both in the small cysts amenable to total extirpation and also in the largest cysts which would take many months for cure after being operated on according to the method of Dupuytren-Heath-Partsch.

A number of surgeons such as Raoult, Jacques, Michel, and Caldwell-Luc, have modified the surgical procedures from time to time. More recently Mayrhofer has introduced three new procedures intended to perfect the methods of his predecessors. The basis of these procedures is the conservation of all the epithelium, including that which covers the anterior wall of the cyst. He operates so as to bring the cyst in communication with the antrum, and both of them into communication with the nasal fossa by a new opening, so that finally the cyst is transformed into an accessory cavity of the nose. Soon after the operation there is a cavity completely invested with epithelium. In his first method Richter's operation is modified by preserving sufficient of the cyst wall to cover the internal surface of the flap. In the second method the operation differs from Hoffman's in that all the anterior part of the cyst wall is conserved. In the third method Denker's procedure is adopted, giving a wider communication between the nasal cavity and that of the cyst at the most accessible point, the incisor recess of the cyst being smoothed out or destroyed by superimposing the mucosa of the alveolar process. The recessus subnasalis disappears as a result of the utilization of its mucosal investment for the flap of the nasal mucosa which is applied to the bottom of the cystic cavity. Mayrhofer places the greatest advantage of his new method in the destruction of the recessus incisivus, which retains secretions and thus delays healing. There appears to be no objection to uniting the nasal and buccal mucosa. The cavity resulting from these operative procedures is easier to keep clean than one in the mouth.

Operation 1.—Horizontal incision from the lateral incisor to second and third molar well away from the gingival margin. The anterior wall of the cyst and the whole of the lining are removed. A rectangular plate of bone, whose inferior margin is adjacent to the floor of the antrum and whose upper border corresponds to the line of union of the processus turbinalis with the processus maxillaris, is removed. The fibromucosa of the nasal fossa is cut into the form of a flap with a wide inferior base, turned inwards into the sinus, and placed on its floor. If the inferior turbinate bone obstructs the naso-antral communication, up to one-third of the anterior end is cut away. The whole cavity is now packed, leaving a gauze wick through the opening of the nostril, and the vestibule sutured over with catgut. The packing is removed in four or five days and the cavity left alone without any irrigation. The sutures are allowed to fall out.

Operation 2.—The cyst is opened and walls and contents are removed as in Operation 1. The opening into the nose is made independently of the maxillary antrum. The cavity is packed and treated as in Operation 1.

Operation 3.—The procedures are as in Operations 1 and 2. In addition the cystosinus septum is freely removed, leaving no recessus. The draining and packing as above.

Indication for Type of Operation.—The first is considered the safest and most rational, and always necessary where the maxillary sinus is inflamed.

The second operation appears to be indicated where the cyst is in the anterior and inferior part of the antrum and not very large. The third operation is necessary where it is not practical or opportune to extirpate the cyst and curette the entire mucosa of the antrum, and where the sinus has not free communication with the nose.

BIBLIOGRAPHY.—*Dental Cosmos*, 1926, May; *Med. Jour. and Record*, 1929, May; *Proc. Roy. Soc. Med.* (Odont. Sect.), 1930, Jan.

OSTEOMYELITIS.

John Fraser, Ch.M., F.R.C.S.Ed.

Acute hæmatogenous osteomyelitis is discussed by R. A. Cutting¹ from an experience of forty-three cases. There are no new facts recorded in relation to the clinical history.

TREATMENT.—Surgical opinion is agreed that in the matter of treatment **Drainage** of the infected area at the earliest possible opportunity is essential. How the desideratum is best accomplished is still a matter of dispute. The gutter drainage, the multiple metaphysial trephine, and diaphysectomy are practised. The last-mentioned has been virtually abandoned, though Hamilton Bailey² advocates it in acute osteomyelitis of the fibula. The **Gutter Operation** is that in most common use, though the **Multiple Trephine** (Starr) is becoming increasingly popular. The tendency undoubtedly is to reduce to a minimum the trauma of operative interference during the acute phase, and certainly this is best achieved by Starr's method.

After-treatment.—In the after-treatment Orr's methods are becoming widely accepted, and those of us who have seen his results have been most favourably impressed. The question of after-treatment is discussed by H. W. Chappel.³ He is an advocate of Orr's principles, and he also makes use of the liquid-tight appliance introduced by Taylor, of Toronto.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, July, 5; ²*Brit. Jour. Surg.* 1930, April, 641; ³*Amer. Jour. Surg.* 1930, April, 565.

OTITIS MEDIA. (See EAR, DISEASES OF.)

OTOSCLEROSIS.

A. J. M. Wright, M.B., F.R.C.S.

Mention was made in the MEDICAL ANNUAL, 1930, p. 183, of the evidence that this complaint is associated with an endocrine upset, and its treatment with parathyroid was also dealt with. L. Mirvish¹ is convinced, as a result of experimental research, that otosclerosis is the result of a low calcium concentration in the blood, produced either by hypoparathyroidism or over-activity of the ovarian secretion. The dry parathyroid extract being uncertain in action, he has treated three cases over periods of from one to three years with **Parathormone** injections in doses of 10 to 20 units twice weekly. The patients' hearing was very carefully tested at intervals, and in two of the three considerable improvement took place during the first two months of treatment. In the third the hearing became no worse.

REFERENCE.—¹*Jour. Laryngol. and Otol.* 1930 July, 449.

OVARIAN HORMONES.

W. Langdon Brown, M.D., F.R.C.P.

A. S. Parkes¹ reviews the whole of this subject very carefully in a monograph on the internal secretions of the ovary. He thinks that their physiology is now established on a sound basis, but is extremely cautious in the application of these results to clinical problems. He believes that we are in possession of valuable therapeutic agents, but feels that it would be a pity if that value should become obscured by the disappointment which will inevitably follow extensive use of them before the technical difficulties have been overcome. How great

these technical difficulties must be seen from the observations of R. T. Frank,² who has tested the efficacy of a number of commercial preparations of the ovarian hormone, some standardized biologically, others not. Of the former, the activity varied from 0 to 30 per cent of the amount claimed; while of the latter, none were active at all. Evidently, if they were fully active when they left the manufacturer, they must have undergone rapid deterioration. Moreover, unpleasant local reactions may occur at the site of injection, and the prices are prohibitive. He too utters a warning against their general use until better products are obtained. In this review, therefore, the physiological and clinical evidence will be considered separately.

PHYSIOLOGY.—The distribution of œstrin is remarkably widespread. It has already been found not only in the ovary, but also in the placenta, the amniotic fluid, and the blood and urine of pregnancy. And now E. C. Dodds, A. W. Greenwood, and E. J. Gallimore³ have isolated it in a water-soluble form from the mammalian testis, and have proved the activity of their product by observing its effects on the growth of the comb in capons. This presence of a hormone stimulating female activity in the essential male gland suggests an interesting train of ideas. The correlation between the hormones of the anterior pituitary and of the ovary has also been further studied. J. B. Collip⁴ finds that the transplantation of the anterior lobe of the pituitary into muscle liberates œstrin from the ovaries of an immature animal. He has also isolated from the placenta a hormone like the ovarian-stimulating hormone of the anterior pituitary in a crystalline form which is quite effective when given by the mouth, the dose then being only two to three times that required by injection. The pituitary growth hormone from the eosinophil cells of the gland, on the other hand, causes the rat's ovaries to be almost completely luteinized with cessation of œstrus.

Aschheim and Zondek have reported constant responses by the ovary of immature mice to the injection of the urine of pregnancy, which they attribute to anterior pituitary hormone. But E. T. Engle⁵ points out that whereas anterior-lobe transplants have the effects as described by Collip above, pregnant urine causes folliculolysis followed by the formation of a corpus luteum with retention of the ovum within it. It is, therefore, difficult to attribute both results to the same anterior-lobe factor. C. F. Fluhmann⁶ finds large amounts of anterior pituitary hormone in the blood after extirpation of the ovaries, and the serum of such blood will excite ovulation in the immature white mouse. This may also be present in the blood of patients with functional amenorrhœa, which suggests that it may be due to a compensatory overaction on the part of the pituitary. (*See also PITUITARY GLAND; PREGNANCY.*)

Corner has produced the pregestational proliferation of uterine mucosa by luteal extracts, and has thereby maintained a pregnancy in a rabbit which had been oöphorectomized after fertilization. He regards the phase of pseudo-pregnancy in the œstral cycle as a phenomenon of entirely luteal origin.

CLINICAL.—On the clinical side the following observations are worth noting. Wilfrid Shaw⁷ treated 15 cases of severe spasmodic dysmenorrhœa with injections of an oily solution of **Ovarian Hormone**; 6 showed no improvement with even 50 units; 9 were much better during treatment, but relapsed when it was dropped. As to amenorrhœa, of 6 cases of the adipose type none were benefited, while of 6 without adiposity all had a return of the periods. This strongly suggests that in the adipose type other endocrine glands besides the ovary are involved.

A. D. Campbell and J. B. Collip⁸ gave the **Placental Hormone** prepared by the latter to three patients. The first, age 17, menstruated after 500 rat units. The second, age 26, received 25 rat units thrice daily for twenty-eight

days, when a period occurred and lasted for three days, having previously only lasted part of one day since a curettage after an abortion one year previously. The third, age 28, received 75 rat units daily for eight days, when a period occurred without pain or vomiting, though previously these had always been present and severe. They did not expect and did not find this hormone to be helpful for menopausal symptoms after pan-hysterectomy.

E. L. Sevringhaus and J. S. Evans⁹ used **Amniotin** from the amniotic fluid of cattle with success for menopausal symptoms. They used 10 units, finding 50, as recommended by some observers, definitely too much. They also claim success for its use as a vaginal pessary in seven cases. Injections in one case of delayed development were successful. As regards the relief of menopausal symptoms, the element of suggestion must not be forgotten, for E. C. Dodds and J. D. Robertson,¹⁰ having prepared an accurately standardized extract of **Œstrin**, noted that 90 per cent of such patients reported an improvement in health and spirits, but that very similar results were obtained with injections of normal saline. Using their preparation for amenorrhœa, however, out of 32 unmarried women 10 responded, while out of 30 married women as many as 18 responded.

REFERENCES.—¹*The Internal Secretions of the Ovary*, 1929, Longmans; ²*The Female Sex Hormone*, 1930, Baillière, Tindall & Cox; ³*Lancet*, 1930, i, 683; ⁴*Canad. Med. Assoc. Jour.* 1930, Feb., 212; ⁵*Jour. Amer. Med. Assoc.* 1929, July 27, 276; ⁶*Ibid.* Aug. 31, 672; ⁷*Quart. Jour. Pharm. and Pharmacol.* 1929, xi, 373; ⁸*Canad. Med. Assoc. Jour.* 1930, Feb., 219; ⁹*Amer. Jour. Med. Sci.* 1929, Nov., 638; ¹⁰*Lancet*, 1930, i, 1390.

PAGET'S DISEASE OF THE NIPPLE. (See NIPPLE, PAGET'S DISEASE OF.)

PANCREAS, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Acute Pancreatitis.—E. Archibald¹ observed that if a little bile was injected into the pancreatic duct of cats a massive glassy œdema was visible within a few minutes; it passed off in a day or two. He has seen the same condition at operation, and believes that this is the cause of left-sided pain in some cases of gall-stone trouble, especially when the pain persists. It is a warning, of course, of the possible development of acute necrosis of the pancreas, and, though the pain usually clears up, it should weigh in favour of early operation in cases of gall-stone colic.

W. Linder and L. J. Morse² publish a statistical study of the symptoms in acute pancreatitis. Intense pain was present in practically all, not relieved by morphia. It was epigastric in 85 out of 88 cases, but also in the right hypochondrium in 59, and in the back in 58; all but two vomited. Two-thirds were cyanosed, 46 per cent distended, 19 per cent shocked, 32 per cent jaundiced, and in 2 cases there was urticaria. In 29 cases the temperature was normal. The pulse is often raised out of proportion to the temperature. Constipation was commoner than diarrhœa, but was not absolute.

German writers emphasize the value of an increase in the diastase content of the blood and urine in making the diagnosis (P. Walzel³ and others).

TREATMENT.—Three are two methods of surgical treatment, **Drainage of the Pancreas**, and **Cholecystostomy** or **Cholecystectomy**. The reason for the latter, of course, is the belief that the infection is due to regurgitation of bile through the pancreatic duct, which is certainly true in some cases, but perhaps not in all. E. Heller,⁴ of Leipzig, quotes three series of cases of acute pancreatitis: 32 cases, in 3 of which the gall-bladder was drained (62.5 per cent died); 38 cases (Schmeiden's series), in 25 of which the gall-bladder was drained, the pancreas also being dealt with (44.7 per cent died); 27 cases (Heller's series), in 26 of which the gall-bladder was drained without dealing

with the pancreas (40.8 per cent died). Linder and Morse, operating on a rather quiet type of the disease (49 showed only œdema and enlargement, 23 also showed hæmorrhage, and only 6 necrosis), had a mortality of 26 per cent. Those treated by drainage of the pancreas alone did badly (23 cases; 60 per cent died). Of those treated by drainage of the gall-bladder or of the bile-duct after cholecystectomy, only 9 died out of 63 cases, which is, of course, very good, but probably includes a number of mild cases that would not ordinarily be regarded as acute pancreatitis and operated on as such.

Cancer of the Head of the Pancreas.—As has been mentioned in previous numbers of the MEDICAL ANNUAL, a good many surgeons are of opinion that it is worth while to operate on cases diagnosed as chronic jaundice due to this cause. I. J. Walker⁵ defends this hypothesis by arguing that there is always a chance that the icterus may be due to some innocent and removable condition, and even if not, a cholecystgastrostomy will probably relieve for a time. None of his 15 cases died in hospital, though two bled a good deal. The pruritus always disappeared, also the jaundice. The survival period after operation is not stated.

REFERENCES.—¹*Ann. of Surg.* 1929, Nov., 803; ²*Ibid.* Sept., 357; ³*Wien. klin. Woch.* 1929, i, 14; ⁴*Zentralb. f. Chir.* 1930, July, 1667; ⁵*New. Eng. Jour. Med.* 1929, Aug., 291.

PANCREATIC TUMOURS. (See ENDOCRINE TUMOURS.)

PARADOXICAL EMBOLISM. (See EMBOLISM, PARADOXICAL.)

PARALYSIS, FACIAL. (See FACIAL PARALYSIS.)

PARALYSIS, GENERAL. (See DEMENTIA PARALYTICA.)

PARATHYROID GLANDS.

W. Langdon Brown, M.D., F.R.C.P.

Hyperparathyroidism.—Since Mandl reported the case of generalized osteitis fibrosa cured by the removal of a parathyroid tumour in 1925, evidence has accumulated on the influence of parathyroid excess in various skeletal diseases associated with the disappearance of calcium salts from the bones. The subject was referred to in the MEDICAL ANNUAL for 1930 (p. 388), but during the last twelve months our knowledge has been extended and clarified, largely owing to the brilliant studies of Donald Hunter on calcium metabolism. How little was understood of this in 1925 is shown by the fact that Mandl actually transplanted four human parathyroids in the first instance into his patient, for it was not then realized that the parathyroid hormone increased the blood-calcium largely at the expense of the bones.

S. Hoffheinz¹ was able in 1925 to collect 44 cases of enlargement of the parathyroid glands found at necropsy, usually of the nature of hyperplasia, and added one of his own. Skeletal disease was present in 27 of these; osteitis fibrosa occurring 17 times, osteomalacia 8, and rickets twice. He suggested that, contrary to the opinion previously held, it was the parathyroid excess that caused the skeletal trouble.

E. P. Richardson, J. C. Aub, and W. Bauer² report in a man a condition resembling osteomalacia, but also presenting a cyst-like area in the femur, which was distinctly improved by the removal of two parathyroids which were apparently normal, even on histological examination. The calcium in the serum was raised to 15 mgrm. per cent, and the urinary excretion of calcium was six to seven times greater than in fifteen normal controls. The phosphorus in the serum was considerably reduced, while its excretion in the urine was

increased. These changes were approximately equivalent to those found in a patient while receiving 100 units of Collip's hormone a day.

V. A. Oppel,³ of Leningrad, reports an interesting series of cases of spondylitis (both of the Bektereff type limited to the spine, and of the more diffuse Strumpel-Marie type), in which not only was the serum-calcium raised but the electrical excitability of the muscles was reduced, thus presenting in both respects the antithesis of tetany. Muscular hypotonia was marked. There was generally a history in the past of some infective process, and Oppel concluded that this had produced a hyperparathyreosis, just as some infections lead to a thyrotoxicosis. He therefore attempted parathyroidectomy on 55 such patients, but in 10 cases found no parathyroid tissue in what he had removed. In 27 cases, however, the blood-calcium was reduced and the stiffness lessened. Where complete ankylosis had already occurred further manipulative treatment was also required. Semarin, in summarizing the results in 49 cases of parathyroidectomy, found an improvement in 33 of them. This is encouragement for trying this operation in a most distressing and hitherto intractable disease. It seems possible that the rare condition of myositis ossificans may prove to be of similar etiology. It is curious, however, that conditions of increased calcification should appear to be due to the same endocrine disturbances as conditions of thinning of the bone. But perhaps they may both be regarded as involving disturbed distribution of calcium salts, which is typical of hyperparathyroidism, where calcium deposits have been found in many organs. It is therefore not surprising that Aub found parathormone useless in myositis ossificans and otosclerosis.

J. D. Boyd, J. E. Milgram, and G. Stearns⁴ found in a young man of 21 who had rapid bowing of the legs that the serum-calcium ranged from 15.3 to 17.6 mgrm. per cent. On X-ray examination all the bones gave evidence of diffuse absorption of calcium salts. A parathyroid adenoma was found and removed; for a time after operation there was a tremor and Chvostek's sign was present, although at that time the serum-calcium was still above normal, as if the patient had to become adapted to the fall in its level. Three months after operation the blood-calcium and phosphorus were normal and the bones showed evidence of progressive repair. They point out that some signs of disturbed calcium metabolism may display themselves before the osseous changes, and that these may permit the diagnosis to be made before the entire syndrome develops. Urinary abnormalities are common, and these in conjunction with the bowed tibiae might lead to confusion with the so-called delayed rickets of renal infantilism. But in renal rickets the calcium is lowered and the phosphorus increased in the blood. It is not surprising that their patient had gastrointestinal symptoms, as these are regular accompaniments of hypercalcaemia caused by overdosage with Collip's parathyroid hormone.

Donald Hunter⁵ records a case of generalized osteitis fibrosa greatly improved by the removal of a cystic adenoma in the parathyroid. Here, too, slight symptoms of tetany occurred.

D. P. Barr and H. A. Bulger⁶ report the case of a woman of 56 suffering from great muscular hypotonia, with hardly any response to the faradic current, swellings on certain bones, and bilateral renal calculi. She developed further signs of decalcification of bones, and her serum-calcium was now found to be 16 mgrm. per cent with a negative calcium balance. She also had giant-cell tumours of the epulis type. A parathyroid tumour was found and removed. Here again tetany developed after the operation, while the blood-calcium was still above normal, and her life was only saved by large doses of **Parathormone** and of **Calcium Chloride** intravenously. Although she improved for a time in many respects, she suddenly developed paraplegia, apparently from

pressure of abnormal vertebræ on her spine. They suggest, as an explanation for the occurrence of post-operative tetany in these cases while the serum-calcium is still above normal, that the sudden removal of much parathyroid tissue allows the calcium-hungry bones to deplete other tissues.

E. L. Compere⁷ describes a case of osteomalacia in a woman of 59 where a diagnosis of parathyroid tumour was made. Removal of the tumour was followed by great improvement.

We may therefore regard it as now proved beyond dispute that many skeletal diseases are due to hyperparathyroidism, and that concomitant symptoms are severe muscular hypotonia, gastro-intestinal disturbances, impaired renal function, and liability to renal calculi. The diagnosis must rest finally on the raised calcium content of the serum. Operation should always be considered, and measures of combating possible post-operative tetany prepared in advance. With regard to the later effects of operation, Hunter considers that it is too early to make a statement. There is no doubt that symptomatic improvement occurs after extirpation of the parathyroid tumour. Eight out of nine patients surviving operation all showed this, and it was possible for some of them to dispense with sticks and crutches. In the two cases where normal parathyroid glands were removed little improvement occurred. Considering the generalized and extensive destruction of bone, one would expect complete repair to take many months or years. It is a very different question from osteomalacia or rickets, where osteoid tissue merely awaits conversion into bone by a process of calcium deposition. He considers that in spite of von Recklinghausen's work osteomalacia is still sometimes confused with generalized osteitis fibrosa due to hyperparathyroidism. He regards osteomalacia as purely a deficiency disease, due to lack of calcium salts, vitamin D, and sunlight, and therefore closely analogous to rickets, and quotes J. P. Maxwell's experience in China in support of this. Maxwell⁸ finds further support for this view in the occurrence of prenatal rickets demonstrated by X rays on osteomalacic mothers. Hunter believes that any parathyroid overgrowth in osteomalacia may be merely compensatory. At any rate, osteomalacia is sharply distinguished from osteitis fibrosa by a normal serum-calcium. This would certainly suggest that cases of osteomalacia reported as benefited by removal of a parathyroid were really not of this nature. In localized osteitis fibrosa he has found the calcium and phosphorus metabolism normal. It is curious that in hyperthyroidism there is also a removal of calcium from the skeleton, brought about, as in hyperparathyroidism, through a lacunar reabsorption by osteoclasts, but in this case there is no increase in serum-calcium.

Hypoparathyroidism.—Spontaneous hypoparathyroidism may occur just as spontaneous myxœdema may do. It is characterized by manifestations of tetany, and sometimes opacities in the lens, brittleness and ridging of the nails, and loss of hair and dental enamel—that is to say, ectodermal tissues may be largely affected. The calcium in the serum is low and the phosphorus high. The introduction of the slit lamp has enabled lenticular opacities without visual disturbances to be detected in a number of diseases in which calcium metabolism is disturbed.

J. C. Brougher⁹ records four cases where parathyroid defect developed after a bilateral subtotal lobectomy, and was relieved by administration of **Cod-liver Oil** and subsequently of **Irradiated Ergosterol**. A fifth patient who developed tetany after extensive intestinal resection was also benefited by irradiated ergosterol.

H. H. Searls¹⁰ advocates Lahey's suggestion that after thyroidectomy the removed specimen should be searched for parathyroid tissue, which should be re-implanted to avoid risks of tetany.

Parathormone Therapy.—J. C. Aub¹¹ states that long-continued administration of parathormone is unsatisfactory because the body appears to acquire an 'immunity' against its action. Donald Hunter¹² successfully treated *latent tetany* with a high calcium Diet, together with 10 grm. of **Calcium Lactate** daily after a five-day course of 30 units of **Parathormone** and 6 gr. of **Thyroid Extract** daily. Previously the patient had always been subject to minor tetany for twenty-two years following an extensive thyroidectomy.

D. Campbell in a case of *post-operative tetany* where continued injection of parathormone seemed unsatisfactory obtained a successful result by giving 50 c.c. of dilute **Hydrochloric Acid** with 10 grm. of **Calcium Chloride** daily. He had found that neither drug separately had an equivalent effect, and that the addition of **Iron Salts** improved their action. As further evidence of the limitation of parathormone therapy, H. Lissner and H. C. Shepardson¹³ give the after-history of the first case of post-operative tetany treated by Collip's hormone in 1925. Increasing doses were required until even 160 units daily reinforced by massive doses of calcium lactate were unable to keep the serum-calcium above 6.9 mgrm. per cent. Transplantation of two parathyroid glands was performed without evident result. Finally, epileptiform convulsions ensued, the temperature rose, and septicæmia resulted from an abscess developing at the site of a puncture. It would appear, therefore, that sometimes substitution therapy becomes inadequate in these cases.

As the storage and excretion of lead and calcium are closely analogous, Hunter and Aub have used parathormone for the elimination of lead in cases of *plumbism*, and have found that a certain amount of lead stored in the bones is rapidly got rid of in this way (Donald Hunter¹²). It is, of course, necessary to be careful not to convert a chronic lead toxæmia into an acute one by dissolving the lead out too rapidly.

W. C. Hueper¹⁴ noted that the general effect of parathormone is vagotonic, such as slowing of the pulse, hyperæmia of abdominal organs, and increased peristalsis of stomach and intestines. As this hyperæmia has a diuretic effect, he advocates parathormone for the symptomatic treatment of *oliguria* and *anuria*, especially as the blood-calcium is often lowered in glomerulo-nephritis, and as a limited course of parathormone is not dangerous if the blood-calcium is properly controlled. In this connection it is interesting to recall that **Thyroid Extract** has been warmly recommended for nephrosis.

REFERENCES.—¹*Virchow's Arch.* 1925, cclvi, 705; ²*Ann. of Surg.* 1929, Oct., 730; ³*Ibid.* Dec., 978; ⁴*Jour. Amer. Med. Assoc.* 1929, Aug. 31, 684; ⁵*Lancet*, 1930, i, 951; ⁶*Amer. Jour. Med. Sci.* 1930, April, 449; ⁷*Surg. Gynecol. and Obst.* 1930, May, 783; ⁸*Jour. Pathol. and Bacteriol.* 1930, xxxiii, 332; ⁹*Jour. Amer. Med. Assoc.* 1930, Feb. 15, 471; ¹⁰*Amer. Jour. Surg.* 1929, Aug., 191; ¹¹*Harvey Lectures*, 1928-9, xxiv, 151; ¹²*Lancet*, 1930, i, 903; ¹³*Endocrinology*, 1929, xiii, 427; ¹⁴*Arch. of Internal Med.* 1929, Sept., 374.

PARATYPHOID FEVERS. (See also TYPHOID FEVER.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—G. Giglioli¹ records his observations on 92 cases of paratyphoid C admitted to the hospital at Mackenzie, British Guiana, between 1923 and 1928. There were 61 males and 31 females. The ages ranged from under 1 year to 60, but the bulk of the cases (45) were between 16 and 25. Cases occurred throughout the year, but there was a decided increase during the winter months from November to May. The principal causes of spread of infection were carriers in the form of abortive cases, mild ambulatory infections simulating malaria, and convalescent patients. The disease was principally spread by urine owing to the insanitary habits of the natives. Of the 92 cases, 32 were fatal—a mortality of 38 per cent. These figures, however,

overstate the real mortality from the disease, as the great majority of the abortive and mild protracted cases do not come under medical observation.

An epidemic of 41 cases of paratyphoid C due to contamination of the water-supply among the native troops at Catanga, in the Belgian Congo, is reported by R. Lewillon²; 25 of the cases died—a mortality of 62 per cent.

B. Le Bourdellès³ records two sporadic cases of paratyphoid C which occurred at a military hospital in Algiers, and are of special interest owing to the rarity of paratyphoid C infection in France and North Africa. One patient was a native suffering from mild infective jaundice, and the other a European who had a mild attack of enteric fever with two relapses. Both had been inoculated with T.A.B. vaccine.

SYMPTOMS AND COMPLICATIONS.—F. J. Apperly and A. J. Brennan⁴ report the first case of paratyphoid A infection which has been published in Australia. The patient was a medical man, age 35, who had never left Australia. His illness was first diagnosed as chronic appendicitis and then as influenza, but the correct diagnosis was established by finding *B. paratyphosus A* in the blood and the agglutination of *B. paratyphosus A* in 10,400. Uncomplicated recovery took place.

A. Brekke⁵ reports the case of a boy, age 12, who after an uncomplicated attack of paratyphoid B became a urinary carrier, which necessitated his staying in hospital for four and a half years. Salol and other urinary disinfectants were useless, and as the right kidney was more heavily infected than the left it was excised. It was not, however, until three months later that the urine became finally negative. As the excised kidney showed no naked-eye changes, the focus of infection may possibly have been in the ureter.

C. Romiti⁶ reports a case of paratyphoid C cholecystitis in a male native of St. Lucia, British Guiana. The case was remarkable for its afebrile course and extreme mildness of the symptoms, spontaneous elimination of the necrotic gall-bladder and cystic ducts, and absence of gall-stones. *B. paratyphosus C* was also found in a gluteal abscess following injection of quinine.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1929, 235; ²*Bruxelles-méd.* 1930, x, 841; ³*Presse méd.* 1929, Aug. 17, 1069; ⁴*Med. Jour. of Australia*, 1930, i, 525; ⁵*Norsk Mag. f. Læge*, 1930, 306; ⁶*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1929, 257.

PELLAGRA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Pellagra among maize-eating natives of South Africa is discussed by E. H. Cluver,¹ who points out that maize and mealies form the chief articles of diet of the large Bantu population, and that for seventeen years past the diets of the non-European jail population in the Union have been very deficient; yet only three outbreaks of pellagra of any importance have been recorded, namely, 150 cases among Zulu rebel prisoners in 1906, in 60 native inmates of the Pretoria Mental Institution in 1912–13, and a recent outbreak of 64 cases among the non-Europeans in the Durban Prison. He also gives references to a small number of scattered recorded cases, especially in native Zululand and Transkei territories, and notes that such may easily be overlooked. The prison diet scales are given, and diet 'E' of the short-service native prisoners is shown to be grossly deficient in total calorific value, proteins of high biological value, and vitamins; an improvement in the scale was followed by a reduction in the cases. The workers in the affected prisons were employed under conditions involving much exposure to the sun, which Cluver thinks accounts for their being especially attacked, and he considers that this aggravated the action of a deficiency of vitamin B₂ in the diet. He advises the addition of beans or yeast to supply Goldberger's 'P-P' factor. Cluver's paper is criticized by W. H. Wilson,² who in 1921 came to the

conclusion, from a study of pellagra among war prisoners in Egypt, that vitamin deficiency is not as important in the etiology of pellagra as is the protein value of the diet, and that if the 'biological value' of the protein fell below 40 to 45 grm. daily, pellagra is likely to occur. He points out that in the 'E' diet it is as low as 14, and also gives a table of other pellagra-inducing diets in support of his theory. W. R. Aykroyd,³ in his turn, argues that the work of Thomas in defining the biological value of various protein diets has not been fully confirmed, while Goldberger in his later work showed that a liberal allowance of such a high-value protein as casein failed to prevent pellagra, but that yeast, containing little protein, did do so, and this has been confirmed by others. Further he points out that Aykroyd and Roscoe showed that the distribution of vitamin B₂ was roughly similar to that of Goldberger's 'P-P' factor as shown in a table, so that at the present time the evidence is decidedly against the amino-acid-deficiency theory and in favour of low vitamin B₂, although further work is required to prove the later hypothesis.

H. S. Stannus⁴ discusses deficiency diseases in Sierra Leone in relation to the work of E. J. Wright, and recalls having first described the lesions at the angle of the mouth, at the canthi, on the prepuce, and on the skin of the scrotum and vulva, now generally recognized as occurring in pellagra, and he refers to later similar observations by others. He thinks the absence of vitamins can only act indirectly by unmasking some other process or causing some toxic factor to come into play. R. H. Guthrie⁵ reviews 14 cases of pellagra seen in the Boston Psychopathic Hospital, with reference to the etiological action of alcohol; he records that 6 of them were profound alcoholics, and he thinks this factor acts mainly through producing loss of appetite and defective digestion, diminishing the absorption of a proper diet. H. M. Shelley⁶ in Nyassaland found pellagra more prevalent in the jail than in the lunatic asylum owing to overcrowding in the former; it did not appear to be related to diet. W. Susman⁷ has studied the pathology of pellagra, and has found the thyroid abnormal in every case, with proliferation, pigmentation, and fibrosis, which he regards as the primary lesion due to bacterial action, and possibly predisposed to by deficient diet.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 751; ²*Ibid.* 1930, i, 101; ³*Ibid.* 647; ⁴*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, April, 627; ⁵*New Eng. Jour. Med.* 1929, Aug. 29, 414; ⁶*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, June 30, 23; ⁷*Ibid.* 28.

PENIS, CANCER OF.

Sir John Thomson-Walker, F.R.C.S.

A. C. Morson,¹ in a paper on the pathology and treatment of carcinoma of the penis, describes in detail three personal cases treated by radium. There are two types of penile carcinoma, the ulcerative and the papilliferous. The predisposing causes of the former are phimosis and decomposition of smegma, whereas the papillary type is preceded by the appearance of venereal warts. Dirt plays a most important part in both varieties. The clinical manifestations of carcinoma of the penis are characterized by chronicity. A swelling is not uncommonly seen which has been present for years before advice is sought. The onset of sepsis, when pain, wasting, fever, and swelling of the inguinal glands take place, leads the patient to seek advice. Treatment may be either amputation by **Gould's Method**, or by **Radium Irradiation**. There is a good prospect of cure when amputation is undertaken sufficiently early, but irradiation is the treatment of choice, in spite of the fact that its results are variable, because of the moral effect of the rapid disappearance of the tumour with retention of the organ. Direct treatment of the glands in the groin is not advised unless the overlying skin is involved, in which case they should be dissected out. Recurrence can be treated readily

by further irradiation, and even if this fails, the patient's health will be so much improved that radical cure by the Gould operation can be effected with a minimum of risk. If the disease is so far advanced that the greater part of the penis has been destroyed, the correct treatment is total amputation.

REFERENCE.—¹*Proc. Roy. Soc. Med.* 1930, March, 667.

PERICARDIAL EFFUSION. (See ARRHYTHMIA.)

PERICARDITIS, TUBERCULOUS.

A. G. Gibson, M.D., F.R.C.P.

L. S. T. Burrell, D. C. Hare, and J. M. Ross¹ record a case of tuberculous pericarditis, the pericardial affection being part of a general tuberculous polyserositis. In this condition they remark that the chief symptoms are those of recurrent pericardial effusions and cardiac failure. Frequently the tuberculous origin is difficult to establish. In the present case it was proved by culture. A previously healthy woman of 49 was admitted to hospital for substernal pain, breathlessness, and continuous fever. She was found to have pericardial effusion from which tubercle bacilli were grown in culture. Then followed in succession left and right pleural effusions, ascites, and œdema of the legs. Enlarged cervical glands and a swelling of the spleen then occurred, and an infection of the left quadriceps bursa. No form of treatment stayed the gradual decline in health which followed, and the patient died two years after the onset from slow congestive heart failure.

‡ The post-mortem showed a long-standing caseous tuberculosis of one Fallopian tube which had given no trouble during life; chronic serositis of the pericardium, both pleuræ, and the peritoneum; fibrosis with little caseation of the spleen and the cervical glands. The absence of tissue necrosis was marked, and was replaced anatomically by a productive fibrosis. In this case the symptoms and signs of congestive cardiac failure were prominent and the effects of the widespread infection and of toxæmia relatively slight. The authors infer from this a relatively high degree of immunity, and that the cardiac failure is the result of mechanical obstruction of the heart and circulation.

REFERENCE.—¹*Lancet*, 1929, ii, 1303.

PERICARDIUM, CALCIFICATION OF. (See also X-RAY DIAGNOSIS.)

A. G. Gibson, M.D., F.R.C.P.

G. E. Vilvandré¹ records a case of a woman, age 67, in whom a calcified pericardium was discovered accidentally during a routine radiological examination of the digestive tract by the opaque meal. The patient complained of pain in the right scapular region and down the right side. The pain occurred in attacks which lasted from two days to a week, and they had no relation to exertion. Freedom from attacks might last seven weeks. There had been a previous indefinite history of indigestion for some years. The heart was strikingly denser than normal under the X rays, most marked at the right auricular and diaphragmatic border. (Skiagrams of the case are given in *Plates LXIV, LXV.*) A sharp angle was formed where these borders joined; no pulsation was visible along this edge. The aorta was normal. There were scattered patches of density over the main cardiac shadow, but they were absent over the apex. Only the apical portion of the heart was seen to pulsate well, and stood out in marked contrast to the rest of the heart obscured by the calcification. There were scarcely any movements of the heart with respiration, and on the screen the cardiac apex looked like a living shadow protruding out of rigid casing. The examination showed an ulcer of the stomach which was confirmed by operation, and there was no untoward result from the anæsthetic. The inference is that this condition is compatible with fair general health. The

apex beat was of natural force and normally placed. The heart-sounds were normal and there were no murmurs. In the electrocardiogram, beyond a slightly more marked P wave, there was nothing abnormal. A short review of the subject sums up the article. The condition occurs most frequently without symptoms during life. Cardiac failure is late and possibly due to other causes, though one case is recorded in 1927 by Jones and Roberts which was accompanied by marked cyanosis and dyspnoea.

REFERENCE.—¹*Lancet*, 1930, i, 564.

PERICARDIUM, SURGERY OF. (See HEART AND PERICARDIUM.)

PERINEPHRIC ABSCESS. (See KIDNEY, SURGICAL AFFECTIONS OF.)

PERITONITIS IN CHILDREN. (See APPENDICITIS AND PERITONITIS IN CHILDREN.)

PERITONITIS, TUBERCULOUS. *A. Rendle Short, M.D., F.R.C.S.*

Charles Mayo¹ says that this may be due to bursting of a tuberculous appendix or a mesenteric gland, or, in women, it may be derived from the Fallopian tubes. The proper treatment in such cases is to remove the tubes, carefully leaving the ovaries. In cases not of this origin, medical treatment, by fresh air and sunlight, etc., gives good results in about 50 per cent. **Oxygen Injection** into the peritoneum seems to help. Removal of tuberculous tubes usually leads to rapid recovery, and averts further trouble in the lungs.

REFERENCE.—¹*Ann. of Surg.* 1929, Oct., 614.

PERLÈCHE. (See SKIN, FUNGUS INFECTIONS OF.)

PERNICIOUS ANÆMIA. (See ANÆMIA, PERNICIOUS.)

PERTUSSIS. (See WHOOPING-COUGH.)

PHARMACOLOGY AND GENERAL THERAPEUTICS.

Ivor J. Davies, M.D.

Glucose.—R. W. McNealy and J. D. Willems¹ (Chicago), in a preliminary study of the glucose enema, conclude from their experiments and a review of the literature that, in view of all the evidence brought forward, the uptake of rectally administered glucose probably depends on the passage of the enema into the ileum through an incompetent ileocecal valve. This very likely is the basis of success in the treatment of hyperemesis gravidarum by rectal glucose administration. The normally competent valve becomes insufficient on irritation or on sufficient pressure from below. Such a condition is not physiologically normal, and at best only small amounts of glucose can be forced into the blood-stream in this way. They conclude that a 5 per cent glucose enema is of little or no nutritional value.

J. J. Pressman² (Philadelphia) has investigated the absorption of glucose per rectum and concluded: (1) That following the introduction of glucose into the rectum the blood-sugar levels fall without a significant preliminary rise; (2) This fall is greater than that occurring during a corresponding fasting period when saline is introduced instead of glucose; (3) The bacterial content of the lower bowel rapidly ferments glucose; (4) Absorption of glucose by the rectum is sufficiently slow to permit fermentation to take place, 25 per cent of the introduced glucose having been recovered in stools four hours after a glucose enema. The patients were adult males without colonic or metabolic disease and were in hospital for minor injuries. From the evidence Pressman

stated that no definite conclusions can be drawn concerning the therapeutic value of glucose per rectum; but this must be left for observation upon the reactions of patients having definite need for glucose.

Diet.—J. M. Strang, H. B. McClugage, and F. A. Evans³ (Pittsburgh, Pa.) have made further studies in the dietary correction of obesity. A reduction diet is described which supplies only the body requirements of protein, vitamins, and salts. The diet averages 360 calories per day, which are derived from 58 gm. of protein, 14 gm. of carbohydrate, and 8 gm. of fat. Thirteen patients showed an average weight-loss of 0.6 lb. per day for fifty-nine days. Clinically the patients were greatly benefited, and showed no untoward reactions in spite of an early nitrogen loss and a theoretical ketogenic-antiketogenic ratio of 3 to 4. Patients have been maintained on this rigid diet without complications for a period of six months. Drugs and endocrine preparations were not used.

Phenyl Salicylate and Calcium Chloride.—A. H. Johansen⁴ (Boston) has investigated the treatment of pyuria due to *Bacillus coli*. He has shown experimentally that the disinfecting power of phenyl salicylate against *B. coli* is increased by concurrent acidification of the urine. When calcium chloride and phenyl salicylate were employed together in the clinical treatment of twenty-four patients suffering from pyuria, cures were obtained in 75 per cent. Calcium chloride alone caused the development of gastric symptoms in some patients, but this was avoided by giving the calcium chloride in tablets coated with phenyl salicylate which contained the proper proportions of both phenyl salicylate and calcium chloride. The tablets contained 0.6 gm. of calcium chloride with a coating of 0.3 gm. of phenyl salicylate. The standard dose was 3 tablets three times daily.

Cibalgine.—G. S. Foster⁵ (Manchester, N.H.) recommends cibalgine as a substitute for opium. He has found it satisfactory both as a pre- and post-operative remedy, and entirely free from any depressing after-effects or habit-forming tendency. Opium in one form or other is now so largely used surgically that a suitable substitute should be used whenever possible.

Carbon-dioxide Foam Baths.—L. Shillito⁶ (London) describes the use of carbon-dioxide foam baths as an efficient substitute for Nauheim treatment. The warm effervescing waters of Nauheim in Germany have become famous for their success in the treatment of cardiac weakness. The recent invention of what is known as a bubble or foam 'distributor' (Baderost), for use with a cylinder of carbon dioxide and a little saponin solution, makes the whole process simple and easy. The principal indication is myocardial weakness. The treatment is not suitable in heart cases with broken compensation, in very marked arteriosclerosis, or in the very old. The baths can be given in a patient's own home, and the distributor can also be used to give a sweating type of foam bath most useful in rheumatic conditions. The baths require medical supervision, and the directions of this practical article should be clearly followed.

Alkalis.—A. A. Osman⁷ (London) describes the pathogenesis and treatment of swelling of the feet and ankles not associated with albuminuria or gross organic disease. Oedema without albuminuria occurs in a variety of well-known conditions, such as several of the anæmias, chlorosis, war oedema, starvation oedema, beri-beri, and varicose veins in the legs. It also not infrequently precedes the appearance of albuminuria in the early stages of some cases of nephritis and pregnancy kidney. The type of oedema which is described here, however, is one which is quite commonly met with, especially among patients of the so-called hospital class, though it is by no means confined to them. It cannot be ascribed to any of the conditions already enumerated,

and is seen chiefly in adult women, in the form of 'pufliness' or swelling of the feet and ankles. It is suggested that the condition is generally associated with, and is probably due to, an underlying acidosis, with consequent increase in the water content of the body as a whole. In many cases the symptom can be abolished by the giving of alkalis by the mouth in amounts sufficient to overcome the acidosis and promote diuresis. In detail the treatment consists simply in giving by the mouth a mixture of 30 gr. each of **Potassium Citrate** and **Sodium Bicarbonate** with 30 min. of **Syr. Aurantii**, in 1½ oz. of water, increasing the number of doses in the day according to need. The intake of fluid is best restricted to three or four pints daily, but no other dietetic modifications appear to be necessary. Most of the patients were attending the out-patient department and pursuing their usual occupations.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1929, Dec., 794; ²*Amer. Jour. Med. Sci.* 1930, April, 520; ³*Ibid.* May, 687; ⁴*Arch. of Internal Med.* 1929, Sept., 303; ⁵*Med. Jour. and Record*, 1930, May 21, 527; ⁶*Lancet*, 1930, i, 1401; ⁷*Brit. Med. Jour.* 1930, i, 780.

PHARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Retropharyngeal Abscess.—Retropharyngeal abscess occasionally results from middle-ear suppuration. L. Haymann¹ notes that it is more frequently met with in association with acute than with chronic otitis. In three of his own cases the complication followed drainage of the mastoid, the abscess pointing in the pharynx, in two cases behind the posterior pillar, and in the third behind the tonsil. Incision through the mouth brought about resolution. There is some question as to the path by which the infection spreads to the pharynx, but the most frequent route is probably through the anterior wall of the tympanum, along cells in relation to the tensor tympani muscle. He suggests that it may sometimes be advisable to do a radical mastoid in such cases to ensure drainage of the Eustachian region of the middle ear.

Stenosis of the Nasopharynx.—The subject of nasopharyngeal deformities, particularly congenital ones, was dealt with in the MEDICAL ANNUAL, 1930 (p. 375). In an article from the Mayo Clinic, F. A. Figi,² dealing with stenosis of the nasopharynx, as a result of the study of eighteen cases, gives the following causes: operation on tonsils and adenoids, hereditary and acquired syphilis, rhinoscleroma, diphtheria, the action of a caustic, and congenital abnormality. The most common of these causes was apparently the operation for removal of tonsils and adenoids, although it is not certain that in every case the operation was the cause. The size of the nasopharyngeal opening is very variable, in four cases complete atresia existing, two of the four being due to syphilis. The symptoms are those of nasal obstruction and treatment is often difficult. The use of **Diathermy** is sometimes successful. In others, by the insertion of a suture through the outer part of the stenosis, leaving it in place until healing has taken place, an epithelialized angle is established, and after free incision the stenosis does not tend to re-form. This method is similar to that used in the treatment of syndactylism. P. Jacques³ speaks favourably of a similar method, in which, however, he uses a loop of rubber tubing instead of a stitch.

Quinsy.—Under the title of "Parapharyngeal Abscess, or the Quinsy that Isn't" E. Watson-Williams⁴ describes a particular type of peritonsillar abscess. Resembling in its clinical features an ordinary quinsy, the most striking difference is the absence of palatal œdema and the low position of the swelling. Its presence should be expected when an incision in the usual site fails to locate pus. This type of abscess, pointing low down below the posterior pillar, can be opened in this situation with a blunt instrument.

Hæmorrhage as a Complication.—Spontaneous hæmorrhage occasionally

complicates a quinsy, and V. E. Negus³ relates two such cases. In one, a week after an incision which did not produce pus repeated severe hæmorrhages took place from the tonsillar region, the blood apparently coming from the upper pole of the tonsil and a crypt at the lower end, and not from the incision. Under an anæsthetic the tonsil was removed and a large peritonsillar cavity full of blood-clot found. This was cleared out and the pillars of the fauces were stitched together over a pack, which was left in for two days. In the second case two small hæmorrhages occurred before any incision had been made, and when the supposed quinsy was incised profuse bleeding took place from the incision. An anæsthetic was administered and tracheotomy had to be performed, followed by ligature of the external carotid. A week later another severe hæmorrhage proved fatal, and a post-mortem showed a large sloughing cavity in which the ascending pharyngeal artery had apparently burst. A discussion took place as to whether in such cases, which are not very infrequent, it was better to try to secure the bleeding point in the tonsillar region or to tie at a distance, i.e., the external carotid. The general conclusion reached was that an attempt should always be made to control the bleeding at the site, reserving ligature of the carotid for cases in which this was found impossible. As in the case quoted above, the collateral circulation is so free that further hæmorrhage may take place after ligature of one carotid.

Mixed Tumour of the Soft Palate.—While mixed tumour of the palate is not common, a large number of cases have now been recorded. In a review of the subject by R. Sonnenschein⁶ emphasis is laid on the very slow growth of these tumours, which may even exist for as long as fifty years before causing serious trouble. Their exact origin is not definitely known, the most probable theory being that they are due to the inclusion of embryonal cells. This is supported by the fact that they have no relation to the surrounding normal structures. They may recur after removal, but show no tendency to produce metastases. Histological examination suggests a malignant condition, but clinical experience has shown that this may be disregarded, local removal of the tumour being sufficient.

REFERENCES.—¹*Zeits. f. Laryngol.* 1929, June, 204; ²*Arch. of Otolaryngol.* 1929, Nov., 480; ³*Ann. des Mal. de l'Oreille*, 1929, Aug., 803; ⁴*Lancet*, 1930, i, 792; ⁵*Proc. Roy. Soc. Med.* 1930, Feb., 515; ⁶*Arch. of Otolaryngol.* 1930, Feb., 137.

PHOTOTHERAPY. (See also CORNEA, DISEASES OF; TUBERCULOSIS, SURGICAL.)

C. Thurstan Holland, F.R.C.S.

Heliotherapy.—F. Eberson¹ reviews the literature of heliotherapy and pulmonary tuberculosis in a paper and adds the result of his own personal experience. He gives an excellent summary of the views of many authors, with their reasons both for and against this form of treatment. One of the conclusions come to by the author of this paper is that the Rollier method of heliotherapy, despite numerous modifications that have been recommended, appears to give the best results. He warns us that indiscriminate sunning should be discouraged and forbidden. He does not agree that necessarily fever and hæmorrhage are definite contra-indications. It is evident also that the author considers that sun treatment in this condition requires great expert care, and that even then it is not to be looked upon as a cure-all, but only as an adjunct to other treatment.

Artificial-light Treatment.—G. L. Cox² furnishes a brief account of the results of artificial-light treatment for tuberculosis affecting various organs. A table of statistics for the year 1929 shows that 842 cases were under this treatment in the 'Light Centres' of the Lancashire County Council. The apparatus consisted of two carbon-arc lamps for general treatment and one

Kromayer mercury-vapour lamp for local treatment. In the summary of results the cases are shortly analysed, the duration of treatment is compared with the duration of the disease before light treatment, and emphasis is laid on the economy and the saving of money.

A paper by H. C. Gram and P. Flemming Möller³ on the results of carbon-arc-light treatment of intestinal tuberculosis shows interesting results. Their material consisted of eighteen cases in which X-ray examination had shown definite evidence of intestinal tuberculosis; the number of light baths given varied from twelve to seventy-five; the dosage was increased from ten or fifteen minutes up to one or two hours according to the tolerance of the patient. Details of each case and treatment are furnished. The results obtained are very good considering the gravity of the cases, and the illustrative radiographs confirm the results.

REFERENCES.—¹*Med. Jour. and Record*, 1929, Sept., 301; ²*Lancet*, 1930, ii, 422; ³*Acta Radiol.* 1930, No. 60, 133.

PIGMENTATION FROM BISMUTH ABSORPTION AFTER THE USE OF B.I.P.P.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Bismuth in the treatment of syphilis was abandoned for a time some years ago owing to the severe toxic effects of the salts then used.¹ Toxicity was found to be largely influenced by the rate at which the metal entered the circulation. The most notable effects of poisoning were stomatitis, nephritis, and enteritis. The commonest sign of intolerance is a slaty-blue line commencing on the gums before or behind the incisor teeth. This blue deposit extends to the entire gum margins or inner side of the cheeks from continuous absorption. (*See also ILLUMINATION AND TRANSILLUMINATION.*) In severe cases a condition of cancrum oris may be found. Before the War pigmentation of the gums was usually associated with lead poisoning or purpura, or the use of charcoal tooth-powders; during the War it was seen occasionally following the application of bismuth paste to open wounds.

Plate XLIII, A, illustrates the case of a boy, age 15, who had suffered from chronic septic osteomyelitis and multiple sinuses of the femur for many years. The bone was exposed through an incision from the trochanter to the knee and a radical operation performed with the aid of a motor saw. About a teaspoonful of B.I.P.P. was smeared over the raw surfaces (*Plate XLIII, B*). A week after operation the patient looked toxic and albumin had appeared in the urine. On examination of the mouth, the under surface of the tongue was found deeply pigmented. The lower alveolar margin, both front and back, was in the same condition. The deep surface of the lower lip was also deeply stained, as was the inner side of each cheek (*Plate XLIV, C*). The appearance was such as to suggest the possibility of sloughing. The characteristic translucency of the blue stains could be well seen by means of a Cameron light.

The patient was treated on alternate days by intravenous injections of ametox, a preparation used as an antidote to poisoning from N.A.B., but said to be equally effective in poisoning from other heavy metals. The wound in the thigh was laid completely open, and a large cigarette drain with a catheter in the middle was connected with an electrical aspirator (Lovac) under the bed. A large amount of bismuth-stained septic material was removed in this way. In about a fortnight the pigmentation was less marked and the patient's condition improved (*Plate XLIV, D*). The operation was performed on Jan. 30, 1930. Six months later, after treatment in an open-air hospital, the pigmentation had almost disappeared.

REFERENCE.—¹*Brit. Jour. Surg.* 1930, xviii, 329.

PLATE XLIII

PIGMENTATION FROM BISMUTH ABSORPTION AFTER
THE USE OF B.I.P.P.



Fig. A.



Fig. B.

Fig. A.—Chronic osteomyelitis of the femur before the operation.

Fig. B.—Chronic osteomyelitis of the femur after radical operation, showing B.I.P.P.
in situ. (Note pathological fracture.)

*Plates XLIII and XLIV by kind permission of the
'British Journal of Surgery'*

PLATE XLIV

PIGMENTATION FROM BISMUTH ABSORPTION AFTER
THE USE OF B.I.P.P.—*continued*

(SIR W. I. DE C. WHEELER)

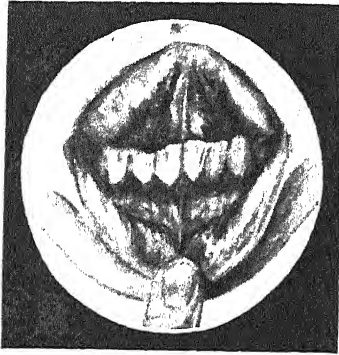


Fig. C.—Deep pigmentation (suggesting imminent sloughing) of the gums, under surface of the tongue and lower lip, and the mucous membrane of the cheeks, after the application of B.I.P.P. in a case of osteomyelitis.



Fig. D.—Same case six weeks later after treatment by nineteen intravenous injections of ametoxy given on alternate days. Suction drainage was applied to the re-opened wound.

PITUITARY GLAND.*W. Langdon Brown, M.D., F.R.C.P.*

The anatomists of the past were frequently intrigued by the relations of the pituitary. Here was the brain enclosed in bone, and there this minute body, like a brain in miniature, also thus enclosed; the two almost separated by dura mater and a 'rete mirabile'—a wonderful net of vessels, but joined together by a stalk. They were struck with the idea of a little shrunken brain which, as it were, responded to or repeated the actions of the big brain above. Modern research has shown that there was more in this idea than was supposed in the nineteenth century, and H. Cushing¹ in his Lister Memorial Lecture has given a brilliant review of the present state of our knowledge of the pituitary body and of the neighbouring diencephalon with which it is so closely associated both structurally and functionally. Indeed, he re-echoes the saying of Ridley in 1695, that "it seems in a manner almost impossible to treat of one independently of the other". This account will, therefore, be largely based upon his lecture, additional recent observations being fitted into their appropriate place. Such a mass of data has accumulated that it is difficult to realize that the first direct observations on the physiology of the pituitary were made by Oliver and Schäfer only five years before the dawn of the present century. "No other single structure of the body is so doubly protected, so centrally placed, so well hidden. . . . Here in this well-concealed spot, almost to be covered by a thumb-nail, lies the very mainspring of primitive existence—vegetative, emotional, reproductive—on which, with more or less success, man, chiefly, has come to superimpose a cortex of inhibitions. The symptoms arising from disturbance of this ancestral apparatus are beginning to stand out in their true significance" (Cushing).

Recent work on the anterior and posterior lobes, the pars intermedia, the stalk of the gland, and the neighbouring diencephalon will be considered in turn.

The Anterior Lobe.—Here, as is well known, are eosinophil cells, basophil cells, and chromophobe cells which resist staining. The eosinophil cells are concerned with growth, and hypertrophy in acromegaly. In earlier life their overgrowth causes gigantism, sometimes general, sometimes local. Beware of amputations for partial gigantism. The amputation of a finger by Fischer was followed by a rapid gigantism of the whole limb. The basophil cells produce the sex hormones, but in animals whose larvae undergo a metamorphosis there appears to be a separate hormone which directs this change. As the mammalian pituitary will produce metamorphosis in the tadpole, the hormone responsible must be present even in animals where such a change does not occur. The thyroid of an animal metamorphosed by anterior pituitary undergoes the changes of a normal metamorphosis (Uhlenhuth), while the thyroid of a hypophysectomized animal atrophies (Allen and others), but is regenerated by implantation of an anterior pituitary (P. E. Smith). The extracts of anterior lobe which induce metamorphosis are those which increase the basal metabolic rate, as would be expected if such extracts acted upon the thyroid. Metamorphosis, indeed, appears to be due to the action of an anterior pituitary hormone acting on the thyroid, and F. A. E. Crew and B. P. Weisner² have separated it from both the sex hormones; for we must speak of two, since one leads to œstrus and the other to luteinization and nidification. It would appear that continuous administration of the former is followed by a cessation of œstrus, as if it stimulated the ovary to the point of exhaustion (Dodds). Rhythm is the essence of reproductive function. Zondek and Aschheim have shown that in pregnancy there is a remarkable increase in this pituitary secretion, and Dodds regards the development of corpora lutea in immature mice after injection of the patient's urine as a very

reliable test for pregnancy, since the urine then contains this hormone. (*See also OVARIAN HORMONES; PREGNANCY AND ITS DISORDERS.*)

It is interesting to note that P. E. Smith found that after castration the anterior pituitary becomes engorged with basophilic elements, and pituitary glands thus modified are particularly effective in restoring experimentally produced sexual dystrophy. It would therefore appear that in both sexes an obligatory cessation of sexual activity leads to storage of the pituitary sex hormone in that gland. Just as oversecretion of the growth hormone causes gigantism, so its undersecretion may cause dwarfism, or, if combined with deficiency of the sex hormone, infantilism. With tumours of the eosinophilic or chromophobe varieties, Cushing finds that the basophilic sex cells are only inhibited as the result of pressure; the relief of such pressure has been followed by normal menstruation and pregnancy. E. P. Poulton and E. C. Warner³ report the case of a woman of 27 who had a skeletal infantilism with delayed union of the epiphyses and a tendency to premature senility. Sexually she was underdeveloped, though normal mentally. This condition was associated with a deficiency of the anterior lobe and a great secondary enlargement of the thyroid with adenomatous masses.

It will be noted that nothing has been said about obesity in this connection. Now, in the rat, as in man, the pituitary is overlaid by a dural membrane merely perforated for the passage of the stalk. P. E. Smith found that in rats removal of the gland below this diaphragm only led to inhibition of growth and sexual activity, while a supradiaphragmatic injury caused striking obesity; Richter produced persistent polyuria also in this way. Such complications as obesity and polyuria therefore mean that more than the anterior lobe is involved.

The Posterior Lobe.—This produces a secretion, pituitrin, which contains two ingredients, pitressin and oxytocin. In discussing the various activities of this lobe, the ingredient responsible for each effect will be stated when it is known.

Effects on Blood-pressure.—The blood-pressure-raising effects of pitressin have rather been lost sight of because of the striking effect of adrenalin in this respect. Yet as between the two glands the pressor action under emotion would be more likely to be produced by the one so much nearer the nerve-centres; and emotional explosions with an accompanying rise of blood-pressure have recently been observed to occur in an animal whose cortical inhibitions have been removed by severing the nerve paths from the frontal cortex to the hypothalamus. As might be expected from these facts, compression of the pituitary stalk is usually accompanied by a low blood-pressure, though there are exceptions to this rule. But it is difficult to account for the fact that when pituitrin is injected into the cerebral ventricle it may cause marked peripheral dilatation with a fall of blood-pressure. There seems to be the same confusion here as there was originally about the effect of pituitrin on urinary excretion. Possibly a study of the separate actions of the two ingredients of pituitrin would clear up some of these difficulties.

The Antidiuretic Effects.—Maddock, by putting a silver clip on the stalk, which avoided damage to any other structure, produced a persistent polyuria but no obesity. Cushing thinks this acted both by interrupting the nervous impulses to the posterior lobe and at the same time mechanically obstructing its secretions. The question of the relative importance of the nervous and secretory factors in these effects will not be solved until it is possible to devise a method of first stimulating and then destroying the definite cluster of nerve-cells which govern the response.

The Oxytocic Response.—P. E. Smith found that after total removal of the pituitary in a rat, leaving the tuber untouched, the muscle-fibres of the uterus atrophy and lose their wave-like contractility. They become normal again,

however, after pituitary transplantation, which excludes the hypothalamus from any possible participation in the process. It should be noted that the reproductive cycle after mating is inaugurated by discharge of the sex hormone from the anterior lobe. This initiates the chain of events which lead to ovulation, while the posterior-lobe secretion facilitates the termination of the cycle by expelling the foetus.

Pigmentary Effects.—It has been known for some years that a tadpole from which the pituitary has been removed becomes albino through contraction of the melanophores in the skin. Moreover, growth is checked and metamorphosis does not occur. All these effects can be counteracted by re-implantation of the pituitary or by injection of fresh pituitary emulsion. But Allen has more recently shown that transplants of the pars intermedia darken the skin again, without affecting growth or metamorphosis. So we must apparently refer this function to the pars intermedia. The antithesis between pituitary defects and defect of the adrenals is interesting, since the former checks pigmentation and the latter increases it.

Galactagogue Effects.—Cushing calls attention to the prolonged period of lactation in acromegalic women, quoting cases in which it lasted for five or even seven years. The reviewer has described three instances of prolonged lactation in patients with pituitary tumours. Cushing thinks this is an indirect effect of the pituitary through its action on the ovary.

Fat Metabolism.—While it has recently been clearly proved that so-called pituitary obesity follows suprasellar damage produced either by experiment or disease, we cannot therefore exclude the secretion of the posterior pituitary from participation in this. Far from it. Removal of the pituitary of a tadpole leads to a large and persistent fat organ. It persists even after starvation, but is soon absorbed after injections of posterior-lobe extract. This accords with Coope and Chamberlain's observation that pituitrin injections lead to fat accumulation in the liver, together with disappearance or diminution of blood-fat, and decrease of fat in the peripheral tissues. Raab has shown that pituitrin injected into the cerebral ventricles is much more effective in this respect than when given subcutaneously. This action is abolished by destruction of the tuber cinereum, by transection of the spinal cord, or by section of the splanchnics, as well as by drugs which are supposed to paralyse the heat-regulating centres. It would, therefore, appear that the hormone stimulates the nerve-centres, whence impulses pass to the liver. Raab concludes that any disturbance of the mechanism between the pituitary and the liver may lead to obesity.

Carbohydrate Metabolism.—It has long been known that hyperpituitarism is associated with a lowered carbohydrate tolerance and not infrequently with glycosuria, which is then usually intermittent. Indeed, Adie thinks that such glycosuria is only persistent in giants and acromegalics. In hypopituitarism there is a raised carbohydrate tolerance. When insulin was discovered, J. H. Burn soon showed that it was antagonistic to pituitrin, as might be expected from these facts. G. Graham has utilized this to check hypoglycæmic reactions after insulin, particularly in children. By adding to the insulin units about one-tenth of that number of pituitrin units the blood-sugar is brought down more gradually and the effect of insulin is thereby prolonged and rendered less disturbing.

The Relationship between the Pituitary and the Diencephalon.—Here we enter on difficult and debatable ground. The close connection between these structures is shown by the following facts. In tadpoles the infundibular protrusion down from the brain does not occur if the epithelial rudiment is removed, while a transplanted epithelial rudiment fails to develop

unless some of the nervous tissue is taken with it. Pars-intermedia cells stream freely into the pars nervosa, becoming converted into hyaline bodies which pass between the glial cells towards the ventricle. If the stalk is mechanically obstructed, the part below becomes turgid with this hyaline material. It must, therefore, represent something which is on its way to the nerve-centres or cerebrospinal fluid. On the other hand, non-medullated nerve-fibres can be demonstrated passing as a compact bundle into the posterior lobe, and ramifying in a basket-like arrangement around the secretory cells here and in the pars intermedia. "In the close connection between these factors—nerve-supply, blood-supply, and epithelial cuff of the tuber—lies the probable explanation of much that has been contradictory in regard to the effects of experimental removal of the pituitary as opposed to injuries of the tuber. The intermediate neuro-epithelial structure cannot be lightly pushed aside in our temporary excitement over the diencephalon and its newly discovered functional importance."

"The diencephalon is an ancient portion of the brain which remains essentially unaltered in all creatures that have a brain at all. Moreover, it proves to have direct connections with the first of the organs of internal secretion to become recognizably differentiated and on which the very perpetuation of the species depends. Such primitive instincts as hunger, thirst, and sleep also seem to be mediated through this region. Cyclicism, which may be diurnal, lunar, or seasonal, is a peculiarity of many physiological processes, such as œstrus, menstruation, hibernation, and, indeed, ordinary sleep. That these processes are somehow under the control of the diencephalo-pituitary apparatus seems most probable. . . . Recent investigations serve closely to relate the diencephalon to metabolic processes, to the primary emotions, and, lastly, to the sympathetic nervous system. . . . Pituitrin injected into the cerebral ventricles has a profound effect in lowering temperature and the basal metabolic rate. We cannot, therefore, safely ignore the possibility of some posterior-lobe participation in the vasomotor and other activities of the inter-brain. It would appear from Raab's work that fat metabolism in the liver, which is associated with the activity of pituitrin, has much to do with the maintenance of the body temperature. . . . It is highly improbable that corresponding effects should be produced either by a hypothalamic lesion or by removing the source of chemical messages, in the absence of any functional interaction. . . . Diabetes insipidus appears to be due to damage of this mechanism, which may have been broken at any one of three principal points: the nucleus, the tract of nerve-fibres from the nucleus to the brain and the pars intermedia and tuberalis of the gland." (Cushing.)

The rabbit, unlike the rat or mouse, normally only ovulates after mating. The actual discharge of the ovum occurs after a lapse of ten to twelve hours, which is also approximately the time it takes for ovulation to be artificially induced by the injection of the anterior pituitary sex hormone. Moreover, if the animal is decerebrated and the pituitary removed within an hour of mating, this cycle is interrupted, whereas if the operation is delayed more than an hour, the normal process of ovulation will go on to completion (A. R. Fee and A. S. Parkes⁴). From this it is apparent that the copulatory act must set going some emotional and excitatory impulses which promptly release the sex hormone from the anterior lobe of the pituitary. Zondek speaks of this hormone as the motor which sets the reproductive cycle going, but the emotional self-starter is probably in the diencephalon.

Pituitary Tumours.—In a discussion at the Royal Society of Medicine, W. J. Adie⁵ criticized the loose classification often adopted, but accepts one which is practically the same as that employed in this article. In acromegaly

the tumour may deform the sella before it produces any other pressure symptoms, and the vision may be involved before any glandular signs are present. He would operate to relieve headache and to save vision. At present he does not think it justifiable to operate for gland disturbances only, but **X-ray Treatment** should always be tried. It is of little or no value in other tumours in this region, and radium has not given good results. He believes the agranular (chromophobe) adenoma producing symptoms of hypopituitarism is much commoner than acromegaly. We have few chances of saving vision; this is one of them, but it is often lost because these tumours are not diagnosed in time. He called attention to 'pituitary tabes' in which there is optic atrophy, loss of tendon-jerks, and pains in the limbs, but *not* an Argyll Robertson pupil.

Cushing¹ describes a case of glioblastoma of the optic chiasma in a girl of 13, in which there was successively loss of vision, disturbance of fat and water metabolism, of thermal regulation, of sleep, and possibly of the vasomotor mechanism. All these effects were finally obscured by the removal of cortical inhibition, which left the patient in a state quite comparable with the 'sham rage' described by Cannon and others in decorticated animals. In contrast with this, the sequence in the congenital cranio-pharyngomas (*see* MEDICAL ANNUAL, 1930, p. 415) is more slowly progressive and produces symptoms by pressure rather than by invasion. They usually start with symptoms referred to the anterior lobe of the pituitary. The patients are often dwarfed or infantile; they may be obese, though some become thin; others develop definite signs of progeria. The emotional state is one of indifference and negativism, quite different from the 'sham rage' in those patients whose hypothalamus is invaded. Adie thinks that these tumours are unfavourable for operation and that the ultimate prognosis is bad. (*See also* p. 362.)

Psychological Features of Pituitary Disease.—The observations on 'sham rage', and the close association of the pituitary with reproduction, throw an interesting light on the psychological accompaniments of pituitary disease. Many of these are the same, whether associated with excess or defect of pituitary activity. In fact, we can in general only speak of the psychological effects of *dyspituitarism* which are presumably due to disturbance of the association between the gland and the diencephalon. Both the pituitary giant and the Fröhlich tend to lack inhibitions. They may have uncontrollable outbursts of temper and may lie and steal and commit offences in a foolish, pointless way, often apparently merely to attract attention. They try to compensate for their feeling of inferiority by a craving for the limelight. They are very prone to fantasy thinking, seeking a dream world in which to escape from this feeling of inferiority. Fantasies of pregnancy, for example, are not at all uncommon.

SUMMARY.

To sum up: the pituitary-diencephalic apparatus directs much of emotional, reproductive, and metabolic life. The most complicated associations are in connection with reproduction, where the emotional state starts through the agency of the diencephalon a secretion from the basophil cells in the anterior lobe of the pituitary, which (1) stimulates ovarian function and then (2) helps to retain the ovum securely in the uterus, until (3) the time comes for the oxytocin secreted by the posterior lobe to contract the uterus and expel the foetus. This stage is reached when the corpus luteum degenerates and releases the oxytocic effect, which under the influence of (2) had been inhibited. The expulsion of milk from the mammary gland is assisted by pituitrin, and its secretion appears to be aided by a pituitary hormone acting via the ovary.

Growth is controlled by the eosinophil cells of the anterior lobe, and if they

are damaged premature old age results. The metamorphosis of larvæ is influenced through a separate anterior-lobe hormone acting on the thyroid.

The pars intermedia influences pigmentation, but during development it also supplies hyaline-secreting cells to the posterior lobe.

The posterior lobe secretes at least two hormones, one of which, pitressin, raises blood-pressure and antagonizes insulin. The effects on the mammary gland and uterus of the posterior-lobe hormone have already been mentioned. The control of water metabolism, which is upset in diabetes insipidus, appears to be due to co-operation between pitressin and the diencephalon. As to fat metabolism, the hyaline cells in the posterior lobe produce something that passes up towards the diencephalon, which then through nervous stimuli operates upon the liver, promoting the consumption of fat. Pituitrin helps in this process by transporting fat from outlying parts to the liver. Insulin and pituitrin being antagonistic, we can understand why in diabetes fat metabolism is increased, since this is directed by pituitrin. This must surely be an additional factor in the ketosis of diabetes. In Fröhlich's syndrome, both anterior and posterior lobes must be involved to account for the combination of gonadal hypoplasia with obesity. This regulation of fat metabolism apparently also plays an important part in the maintenance of body temperature, which is comprehensible in view of the high caloric value of fats. Indeed, nowhere are chemical and nervous factors so closely associated as in the pituitary-diencephalic region; primitive emotions and fundamental instincts cluster thick around it, and through it the rhythm of life is largely regulated.

TABLE OF PRINCIPAL PITUITARY FUNCTIONS AND DISEASES.*

| | SECRETION | DISEASES DUE TO | |
|----------------|---|--|---|
| | | Overaction | Underaction* |
| Anterior lobe | Growth hormone from eosinophilic cells | Gigantism Hemihypertrophy Acromegaly | Dwarfism Progeria |
| | Sex hormone from basophilic cells | Virilism in women | |
| Posterior lobe | Pitocin (oxytocin), contracting the uterus | Pituitary glycosuria | Some cases of subinvolution of the uterus |
| | Pitressin, raising blood-pressure, affecting diuresis, and antagonizing insulin | | Diabetes insipidus |

*Underaction of both lobes is responsible for Fröhlich's syndrome.

REFERENCES.—¹*Lancet*, 1930, ii, 119, 175; ²*Brit. Med. Jour.* 1930, i, 777; ³*Guy's Hosp. Rep.* 1929, Oct., 409; ⁴*Jour. of Physiol.* 1929, July, 383; ⁵*Proc. Roy. Soc. Med.* (Med. Sect.) 1929, Oct. 22, 1; ⁶Langdon Brown, *St. Bart.'s Hosp. Jour.* 1930, Feb., 75.

PITUITARY TUMOURS. (See also p. 360.)

Geoffrey Jefferson, M.S., F.R.C.S.

X-ray Treatment of Pituitary Tumours.—The most important work on the X-ray treatment of pituitary tumours has been furnished by E. B. Towne, of San Francisco. Four years ago he published reports of two cases of pituitary tumour in whom the visual acuity and visual fields had been restored to practically normal after X-ray therapy. Radiation can be expected to give results only when the tumours are solid, and as these solid tumours do not give good lasting results even with operation, it would be a great advantage should they

prove to be sensitive to X-ray treatment. Towne's first cases seemed to show that they were. He now records¹ the later history of these two cases and three additional examples. In his first case vision failed so rapidly a year after his first report, and five years after X-ray treatment was started, that operation had to be undertaken. Towne made a trans-sphenoidal evacuation of a cyst. He thinks the cyst formation was a late occurrence in a previously solid tumour, and that its development accounted for the failure of X-ray treatment. At necropsy a huge tumour was present, four-fifths of it solid. In the second case an operation had to be performed also, five months after the publication of his paper, and again a cyst was evacuated. This patient is well four years later. In the third case radiation failed to effect any result, but operation was refused. In the fourth case there was no response either to X-ray or later to operation. The fifth was more successful, for here a bitemporal hemianopia disappeared with X-ray treatment and there was a return to full acuity. The dosage of X rays was 200 R to each of five cases, spread over three days every month. Towne concludes that a trial should be made of X-ray treatment in all pituitary tumours, that some will respond and some will not, that those which do not are probably cystic, and that the cystic tumours give the best results with operation. Whether these conclusions will be confirmed by further and wider experience remains to be seen. There is no harm in trying X-ray treatment on these tumours, always provided that the case is carefully watched by the taking of the visual fields every month or so, so that a really accurate idea may be obtained as to what is happening to the tumour. If it is really diminishing in volume, the optic nerves will be relieved of some of the pressure on them and the fields should enlarge progressively. In my own experience no good has yet accrued except in one case, a lady who has remained stationary, and very well, for eight years, but her fields have never improved; they have not become worse. One other case became worse after X rays and had to be operated upon quickly (this was a solid tumour), and another got steadily worse all the time. One or two other cases at present under treatment seem to be improving, but no striking change has occurred in the fields as yet.

The fact that X-ray treatment can in some cases cause an expansion of the visual fields and an improvement in acuity means quite definitely that something happens to the tumour, therefore, in this therapy; but it seems to the reviewer highly probable that nothing more than a certain reduction in bulk takes place. We have yet to see a case in which an adenoma has actually melted away under the influence of the rays. Towne's first case, which seemed to be so hopeful when he wrote his first paper, is a good example, for after five years of radiation the tumour was at least as large as a hen's egg, judging from the photographs, and the patient had been well treated.

REFERENCE.—¹*Ann. of Surg.* 1930, Jan., 29.

PITYRIASIS FOLLICULORUM (Demodex).

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Although frequently found invading the larger pilo-sebaceous follicles, it is uncertain whether the small acarus *Demodex folliculorum* produces pathological changes in the skin. That it does so has been suggested from time to time. Hermann Lawrence and Whitfield have both described impetiginous lesions which they have ascribed to this parasite, and other observers have suggested that certain pigmentary changes may be produced by it.

S. Ayres, jr.,¹ describes an eruption which he thinks is probably produced by the demodex. He has observed eleven cases, all in women, of whom all but two used soap on the face infrequently or not at all. The symptom-complex consisted in a sensation of burning or irritation of the face, together

with dryness and a characteristic roughness, due to the accumulation of a white, frosted-looking scalliness about the base of the lanugo hair, giving rise to a stippled or nutmeg-grater-like appearance. Large numbers of active parasites were found in the scales. In all the patients in whom the subsequent course could be followed, the vigorous use of **Soap and Water** and a strong **Parasiticide Ointment** was followed by clinical improvement and by a diminution in the number of parasites found on microscopic examination.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1930, Jan., 19.

PITYRIASIS LICHENOIDES ET VARIOLIFORMIS ACUTA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Jadassohn in 1897, under the name of 'psoriasiform and lichenoid eruption', and Juliusberg in 1899, under the title 'pityriasis lichenoides chronica', described cases of a chronic eruption characterized by the appearance of pinkish macules or papules chiefly distributed on the trunk. The eruption was of long duration and very resistant to treatment. In the later stages fine mica-like scales appeared on the maculo-papules. Brocq later renamed this condition 'parapsoriasis en gouttes'. The etiology is still quite unsolved. In 1916 Mucha first described a variant of this condition in which some, though not all, of the lesions showed a tendency to develop hæmorrhages and to become necrotic. In 1926 J. Almkvist¹ was able to collect ten cases of this condition and adopted the name 'pityriasis lichenoides et varioliformis acuta', originally suggested by Habermann for the condition. Since the publication of Almkvist's paper, a number of cases have been recorded in this country. A. M. H. Gray described a case in 1926, and another in 1928, and since then a number of further cases have been described. The case illustrated (*Plate XLV*) is one that has existed for about two years; the patient is a police constable, and though the eruption has been very extensive and very necrotic, he has not been off duty for a single day. A variety of treatments have been adopted, but so far without any marked result.

REFERENCE.—¹*Dermatol. Zeits.* 1925-6, xlv, 157.

PLACENTA PRÆVIA. (*See LABOUR AND ITS COMPLICATIONS.*)

PLAGUE.

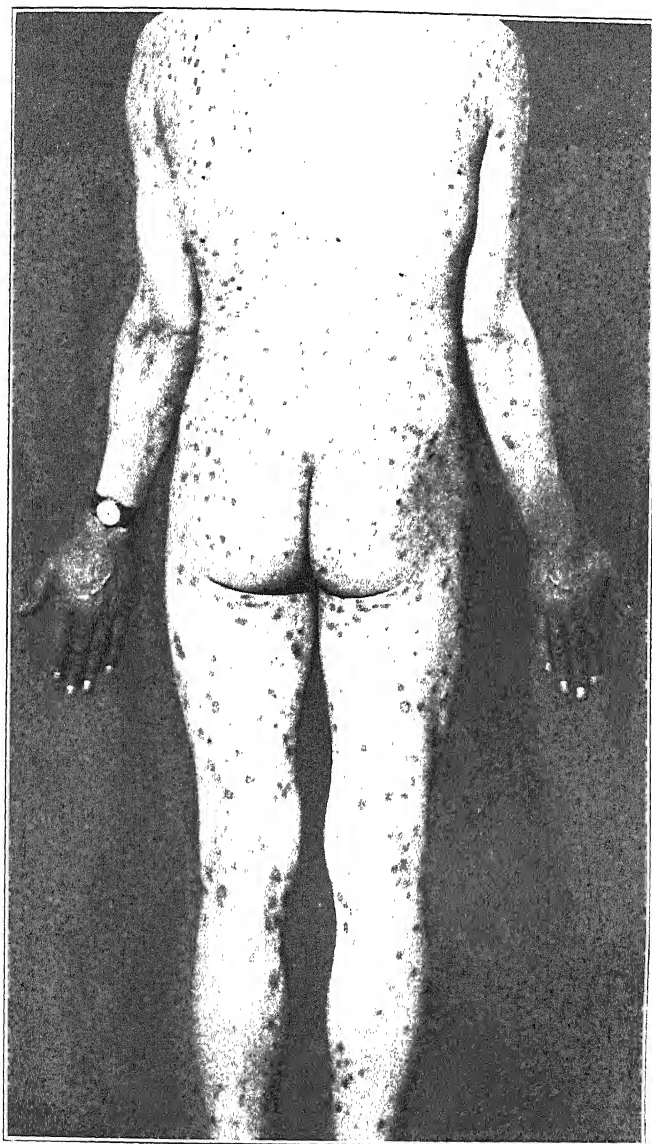
Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

PROPHYLAXIS.—J. A. Mitchell¹ records a trial of tunnels made of wire, with trapdoor valves allowing of passage in only one direction, into a box-trap, which is used for catching rats on a large scale in grain stores in South Africa and can also be applied to ships. P. C. Flu² records experiments to immunize rats against plague by means of dissolving concentrated suspensions of virulent plague bacilli by means of bacteriophages, and he reports a highly protective action on rats following one to three injections of such a vaccine without local or general reactions in the animals, so he thinks its use is justified to protect persons exposed to infection during a plague epidemic among rats.

TREATMENT.—B. P. B. Naidu and others³ report experiments with a view to producing a more potent **Anti-plague Serum**, and record the production on a small scale of such potent serums in rabbits, sheep, and calves immunized with the *B. pestis*, which seem to be nearly three times as potent as that obtained from the Paris Pasteur Institute when tested on experimental animals. J. H. H. Pirie⁴ reports a trial of **Bacteriophage** in the treatment and prophylaxis of plague in rats, and he used a very active phage without obtaining any reliable results in treatment; but repeated doses were of some

PLATE XLV

PITYRIASIS LICHENOIDES ET VARIOLIFORMIS ACUTA



prophylactic value, although of too slight and uncertain a nature to be of practical value as compared with inoculation.

REFERENCES.—¹*Ann. of Trop. Med. and Parasitol.* 1929, Dec., 443; ²*Jour. Trop. Med. and Hygiene*, 1929, Dec. 16, 353; ³*Ind. Jour. Med. Research*, 1930, April, 1259; ⁴*Publ. S. African Inst. for Med. Research*, 1929, Dec., 195.

PLEURISY.

W. H. Wynn, M.D., F.R.C.P.

L. B. Smith¹ has for many years adopted the rule of treating cases of pleurisy without signs of lung involvement as if pulmonary tuberculosis had been diagnosed. On discharge from the sanatorium, patients are told to avoid all heavy work for the next two or three years. They must continue to sleep with open windows and carry out a rest cure for an hour or two every day. During this period they must take no active part in sports. Between May, 1916, and June, 1924, there were 90 cases of pleurisy. The pleurisy was exudative in 66 and dry in 24; 60 were males; 68 were between the ages of 15 and 27. The average interval between the development of pleurisy and admission to the sanatorium was six months, and the average stay in the sanatorium was 121 days. The subsequent fate of the patients was investigated in 1928—that is, four to twelve years after admission. One could not be traced. Of the remaining 89, 79 were well and perfectly fit for work; 3 were suffering from pulmonary tuberculosis, and 7 had died of tuberculosis. The 10 who developed pulmonary tuberculosis did so within four years of the outbreak of the pleurisy. This proportion is much lower than that given by most authorities, and the author argues that the incidence is largely determined by the attitude taken by the patient's medical adviser.

Sir Thomas Horder,² discussing the treatment of pleuritic effusions, said that the great majority of these were tuberculous. Treatment follows traditional lines. If very large, they are tapped as soon as they are diagnosed. If associated with respiratory or cardiac distress, and this is referable to the effusion, again they are tapped as soon as diagnosed, and irrespective of size. If they show no sign of absorption after fourteen days or so from the date of their discovery, they are tapped. Too early an interference is meddling. There is a definite evolution in the exudative process, so that the fluid tends to collect again if removed before the high tide is reached. But a more important reason against premature removal is that by such interference the associated collapse of the lung is interfered with and expansion encouraged. This might lead to tuberculous activity in the lung should it be the seat of infection. A pneumothorax might also follow from the same practice. The patient is from the first regarded as tuberculous, and general measures are put into action. Slow **Aspiration** is better than siphonage, and if the operation is unhurried the risk of too rapid expansion, as shown by cough, hæmoptysis, or albuminous expectoration, is negligible. Care must be taken that the local anæsthetic is effective. The amount of fluid removed depends upon the case. Fairly rapid absorption sometimes follows removal of quite a small amount. On the other hand, with large effusions there is nothing to be gained by ceasing aspiration so long as the fluid flows easily and the patient is comfortable. Convalescence must on no account be hurried, nor must respiratory gymnastics be used too soon. A return to ordinary life must not be considered for three months, and it may be necessary to extend this period. Even then there should be daily rules for observance as for a case of pulmonary tuberculosis.

L. S. T. Burrell³ would in all cases first remove 5 c.c. of fluid for examination, because he considers treatment is largely dependent upon the nature of the fluid. Aspiration should not be performed except: (1) To relieve pressure symptoms such as dyspnoea; (2) To convert the condition into an artificial

pneumothorax if the lung is actively tuberculous; (3) To encourage the underlying lung to re-expand owing to active disease in the other lung; (4) To treat chronic and recurrent pleural effusions. He maintains that removal of a quantity of fluid is not free from danger, even of sudden death. More common complications are violent paroxysms of coughing, severe dyspnoea, oedema of the lung, or activation of a previously quiescent tuberculous lesion in the lung. In order to prevent these it is wise to introduce air or oxygen into the pleural cavity if more than 15 oz. of fluid are withdrawn. Aspiration would rarely relieve toxæmic symptoms and might make them worse. Most of the acute cases settled down and did best without aspiration. In very chronic and recurrent cases **Aspiration** should be performed and the cavity gently irrigated with **Dakin's Solution**, **Oxygen** being introduced and a negative pressure of about 6 cm. of water left. The after-treatment is of the greatest importance, for on it may depend whether the patient becomes consumptive or not.

A. Di Natale¹ advises removal of the fluid and replacement by air. He records twenty cases treated in this way. In almost all the temperature was favourably affected, in some beginning to fall at once or the same day. In some, fluid re-formed and another operation was required. In only one, in which the operation was performed ten times in four months, was no success obtained. The subsequent history was better than those not treated by injection of air. Only two cases developed pleural thickening, and three adhesions, but these could be broken down by increasing the intrapleural pressure. He considers that the method renders possible complete evacuation of fluid at one time, and even if it does not, it makes re-accumulation less easy and less frequent. It saves the risks inherent in the operation, and it almost completely restores in most cases the function of the lung by preventing adhesions. In cases with active tuberculosis in the lung the introduction of gas forms the prelude to regular treatment by artificial pneumothorax.

F. G. Chandler⁵ discusses the treatment of pleural effusions in artificial pneumothorax. Unless there is some special reason for removal he would leave them alone. Aspiration repeated two or three times appears to make the effusion thicken and become yellow. The special reasons for interfering are: (1) If it appears to be producing fever; but time must be allowed to let it settle down if it will. (2) If the effusion persists for many weeks and it is feared that the pleura will become greatly thickened. (3) If it increases to such an extent as to prevent radiological control of the collapsed lung. (4) If obliterative pleurisy threatens. In such a case breath-sounds begin to be heard at the base and a translucent area appears on screening towards the mid-line. The heart is drawn towards the fluid. If the time has arrived for the lung to expand, nothing need be done except perhaps a **Phrenic Evulsion**. If it is necessary to keep up the collapse, immediate action is necessary. Replacement may be tried once, but will probably be ineffective; the effusion recurs and the two layers of the pleura begin to approximate at the base. The best treatment then is to replace by oil and produce a complete or nearly complete oleothorax. The oil mainly used has been **Olive Oil** with 5 per cent of **Gomenol**. (5) When a tuberculous empyema is forming, the evidence of which is the thickening of the fluid and the appearance of large numbers of tubercle bacilli, the best treatment is also to replace with oil.

H. Lowenburg⁶ refers to 9 cases of pneumococcal empyema in which intrapleural injections of **Ethylhydrocupreine Hydrochloride** were given. In 4 rib resection and drainage was done after four to six injections; all recovered completely. Five were not treated surgically and also made complete recoveries. In all the cases pneumococci were found in the pus. At each aspiration as much pus as possible was removed, and then from 5 to 10 c.c.

of a 5 per cent sterile solution of the drug was injected slowly into the cavity. No ill effects were observed. From three to ten injections are made at intervals of about three days. In all cases there was a retrogressive change in the pus, even in those which later were operated upon. The thick yellowish pus changed to a thin scrofulous and watery fluid. Even if the treatment has no specific action, it has the advantage of delaying operation until the pneumonia has well subsided, and during this period of treatment it was possible to increase the patient's resistance and well-being and even his weight. All the patients operated upon were free from fever, or almost so, at the time of operation, and all made a speedy recovery.

REFERENCES.—¹*Norsk Mag. f. Læge*, 1929, 414; ²*Brit. Med. Jour.* 1929, ii, 605; ³*Ibid.* 246; ⁴*Riv. di Patol. e Clin. d. Tuberc.* 1929, 741; ⁵*Tubercle*, 1930, March, 255; ⁶*Jour. Amer. Med. Assoc.* 1929, July 13, 106.

PNEUMONIA. (*See also* DIATHERMY.) W. H. Wynn, M.D., F.R.C.P.

P. N. Coryllos¹ holds the opinion that pneumococcal pneumonia should be considered as a pneumococcal atelectasis. Experimental pneumonia was produced in dogs by intrabronchial insufflation of broth cultures of pneumococcus Type IV, and almost constantly a lobar pneumonia was produced. X-ray examination gave the appearances of atelectasis due to bronchial obstruction—namely, opacity of the affected lobe, elevation of the diaphragm, and displacement of the heart and mediastinum to the affected side. Bronchoscopic examination showed obstruction to the bronchus of the affected lobe. Bronchoscopic examination was then undertaken in 9 cases of pneumonia in men, and in every case it was found that the bronchus corresponding to the consolidated area was occluded with viscid exudate. No shock was produced by the bronchoscopy, and some relief was obtained by aspiration of some of the exudate. P. N. Coryllos and G. L. Birnbaum,² in support of the above opinion, bring forward evidence to show that, contrary to the usual view, the size of the consolidated lobe in pneumonia is smaller than normal. They maintain that physical and X-ray examination show a constant elevation of the diaphragm on the affected side and absence of displacement of the heart to the opposite side. Displacement of the heart and mediastinum to the affected side is often observed. The paravertebral area of relative resonance on the affected side in cases of unilateral extensive consolidation of the lower lobe and the skodaic resonance at the upper level of dullness are further evidence. They consider that the apparent enlargement of the consolidated lung seen at post-mortem examination is due to the collapse of the healthy lung when the chest is opened.

D. Stewart and H. J. Gibson³ studied 50 cases of pneumonia occurring in the influenza epidemic of December, 1928, to February, 1929; 80 per cent of the cases were between the ages of 20 and 40, and 76 per cent were males. In 44 cases the onset was sudden, and only 6 had prodromal symptoms. The predominating early symptom was a mild rigor, rapidly followed by a short suppressed cough, which in half the patients was accompanied by pain in the chest. In 20 per cent no sputum was obtainable until the third or fourth day, but in the rest a copious, viscid, purulent blood-stained sputum was characteristic. Eight cases died; in 34 of the 42 who survived, the illness terminated by crisis, in the greater number on the seventh day. Forty-five showed the physical signs of a lobar pneumonia. Careful bacteriological examinations were made and the following organisms were found—*Streptococcus viridans* in 64 per cent, *Bacillus influenzae* 53 per cent, pneumococcus 41 per cent, *Micrococcus catarrhalis* 31 per cent, *Staphylococcus aureus* 17 per cent, pneumobacillus 8 per cent, and *Str. hæmolyticus* 2 per cent. Of the pneumococci the percentage

of the various types was: Type I 19 per cent, Type II 48 per cent, Type III 9 per cent, Group IV 23 per cent. In the 8 fatal cases a pneumococcus was present in all, and the influenza bacillus in 6.

J. M. Alston and D. Stewart¹ investigated the types of pneumococci in lobar pneumonia in Edinburgh from January, 1929, to June, 1930. The number of cases examined was 186, and the type incidence was: Type I 29 per cent, Type II 40 per cent, Type III 4 per cent, and Group IV 27 per cent. These results contrast with those of Davidson and McLachlan in Edinburgh in 1924-5. They found Type I in 60 per cent, Type II in only 12 per cent. There has therefore been a considerable change in type in this locality during the last five years. Of the 186 cases 45 died—a death-rate of 24 per cent. According to types, the death-rate with Type I was 23 per cent, Type II 31 per cent, Type III 71 per cent, and Group IV 10 per cent. This order of severity accords with the results of other workers which have shown the high mortality of cases with Type III infection and the low mortality of those with Group IV.

TREATMENT.—W. W. G. MacLachlan, G. J. Kastlin, and R. Lynch² advocate the use of **Dextrose** in the treatment of pneumonia: 400 to 600 gm. of dextrose are given by mouth per day; 200 gm. are dissolved in a litre of water to which is added the juice of two lemons. The litre thus contains 800 calories. The patient is encouraged to drink two to three litres in twenty-four hours. When it is impossible to give sufficient by mouth, a 25 per cent solution is given intravenously four to six times in twenty-four hours, the quantity injected never exceeding 200 c.c. at one time. It is given slowly, an injection taking half an hour. This method is especially used for toxic cases. The nutritional value would appear to be the most important factor in this form of therapy, but there are clinical signs of an improved circulation which might indicate a direct action on the heart muscle. They found a definite lowering of mortality in all groups of cases which received adequate dextrose treatment.

J. Wyckoff, E. F. Du Bois, and L. O. Woodruff have investigated the effects of **Digitalis** in pneumonia in a group of patients over two years. The same group had also been used for the investigation of the effects of **Serum**, alternate patients being given serum. Patients were divided into four classes: *A* received serum and no digitalis; *B*, serum only; *C*, digitalis only; and *D*, serum and digitalis. Electrocardiographic examination was made in all cases. The digitalis was given in divided doses. No case received more than 0.15 cat units per pound of body weight, and the drug was stopped if toxic symptoms appeared. During the first year the dose was divided into the following portions—30, 30, 15, 15, and 10 per cent given six-hourly. During the second year patients were divided into two groups, above and below 150 lb.; the lighter group received 10 cat units or 1 gm., and the heavier 12.5 cat units or 1.25 gm., in each case in three doses, 50, 25, and 25 per cent of the total, the second being given twelve to eighteen hours after the first, and the third six to eight hours later. The results in 742 patients were as follows:—

| YEAR | NO DIGITALIS | | | DIGITALIS | | | DIFFERENCE |
|-------|--------------|------|---------------|-----------|------|---------------|------------|
| | No. | Died | Mortality | No. | Died | Mortality | |
| 1 | 197 | 68 | Per cent 34.5 | 158 | 67 | Per cent 42.4 | 7.9 |
| 2 | 207 | 68 | 32.9 | 180 | 73 | 40.0 | 7.1 |
| Total | 404 | 136 | 33.7 | 338 | 140 | 41.4 | 7.7 |

The difference of 7.7 per cent is an increase of more than one-fifth. It has been advised that digitalis should be used as a routine in older patients, but patients over 50 receiving digitalis showed a 7.8 per cent higher mortality. The results were not due to a preponderance of any type of pneumococcus in the different groups. The authors conclude that there is no evidence that routine digitalis therapy results in a lower mortality. In patients with sinus rhythm the only consistent evidence of digitalis effects are the electrocardiographic changes, and these showed a mild toxic effect. About 95 per cent of the patients had sinus rhythm. They found that the clinical symptoms of digitalis toxicity in pneumonia patients are not a sufficient guide to treatment, and that the amount of the drug used was a better guide. When given in doses too small to show any effect digitalis causes no change in the mortality. When given in doses comparable to those usually needed in the treatment of heart failure it produced changes in the P-R interval and the T wave, but caused little change in the mortality. Digitalis may be life-saving in an occasional patient with auricular fibrillation or flutter, but these instances occur rarely and the patient may recover without digitalis. It is concluded that the routine giving of digitalis in lobar pneumonia is useless and dangerous.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1929, July, 8; ²*Ibid.* 15; ³*Edin. Med. Jour.* 1929, Oct., 607; ⁴*Brit. Med. Jour.* 1930, ii, 860; ⁵*Amer. Jour. Med. Sci.* 1930, Jan., 93.

POISONING. (See FOOD AND THE PUBLIC HEALTH; INDUSTRIAL DISEASES.)

POLIOMYELITIS.

Macdonald Critchley, M.D.

For years many clinicians have held the view that poliomyelitis is a common malady which may affect a high proportion of the community in very slight degree without the subsequent development of paralysis. This opinion has recently received striking confirmation from experimental researches carried out by various workers. Anderson and Frost¹ had discovered as long ago as 1911 that the serum of normal people in several cases contained antibodies against poliomyelitis. This was confirmed by Leake² in 1918. H. J. Shaughnessy, P. H. Harmon, and F. B. Gordon³ found that the serum of healthy infants under two years had but little effect on the virus, while the serum of individuals over two years resembled in properties that obtained from convalescent cases. The serum of city-dwellers neutralized more frequently than that from country-dwellers; in both classes the chance of neutralization increased with age. W. L. Aycock and S. D. Kramer⁴ obtained neutralization in about 50 per cent of normal cases in their series of 75 subjects. In this country Fairbrother and Brown⁵ have confirmed the frequent presence of antiviral properties in the serum of normal individuals.

Valuable clues as to the mode of entry and spread of the virus of poliomyelitis have been elucidated by the work of R. W. Fairbrother and Weston Hurst.⁶ By the experimental production of the disease in monkeys it could be determined that, contrary to the usual belief, infection spreads commonly not by the meninges but by the axis cylinders. Their work also confirmed the earlier observations of Römer (1911), in that inoculation of virus into one cerebral hemisphere was often followed by paralysis in the contralateral lower limb. Meningitis is not the primary lesion and may, indeed, be absent. The lesions of poliomyelitis spread from above downwards, affecting the anterior horns in particular; these cellular lesions are not the result of accompanying interstitial changes (Weston Hurst⁷). The frequency with which the legs are affected has been cited by some as evidence of an entry of the virus from the intestinal route; the authors, however, trace this clinical experience to a

particular susceptibility of the anterior horn cells of the lumbar region of the cord. The virus is present throughout the nervous system, but occurs in greatest amount in those regions in which nerve-cell degeneration is most severe. It is only rarely found in the cerebrospinal fluid. The importance of an early examination of the cells of the cerebrospinal fluid in cases of acute poliomyelitis has been emphasized by G. M. Lyon.⁸ He describes an active cytotoxicity in the fluid which affects particularly the polymorphonuclear cells. According to the author, a pleocytosis comprising 50 per cent or more of multilobed cells, with a clear fluid, is suggestive of the diagnosis. When in the course of twenty-four to thirty-six hours there is a fall in the total cell count with a shifting of the differential count towards a mononucleosis of 90 per cent or more, the diagnosis of poliomyelitis is certain.

TREATMENT.—Some fifteen years ago Hoyne and Cepelka treated a number of cases of poliomyelitis with intrathecal injections of **Epinephrin**. In several cases a temporary improvement in the paralysis resulted, but the results were short and in some instances there were harmful side-effects. M. B. Brahdy and I. H. Scheffer,⁹ using 5 c.c. of a 1 per cent solution, injected **Ephedrine** into the spinal canal in a series of ten cases of bulbar poliomyelitis. Five of the patients died, as compared with 75 per cent of a control group of similar cases. The authors feel that the ephedrine injection reduced the mortality and was of therapeutic value.

J. I. Durand¹⁰ has pointed out that in the severe bulbar types of poliomyelitis death more frequently occurs from the patient drowning in retained secretions than by paralysis; he therefore advocates **Postural Treatment**, i.e., that the patient should be nursed with the head lowered. The ankles are tied to the foot-rail and the child is turned on the face; the foot of the bed is then raised 24 in. This position may be maintained for many days.

The use of **Convalescent's Serum** still holds an important place in the treatment of acute poliomyelitis. To be of any value, the injection should be carried out in the pre-paralytic stage; if delayed beyond the first twenty-four hours the value is nil. In ascending cases serum is worthy of trial, but there can be no guarantee of recovery (J. Macnamara¹¹). W. H. Kellogg¹² has shown that the prophylactic value of intramuscular or subcutaneous injection of convalescent serum in times of epidemic is supported by the results of animal experimentation. The practical difficulty of rapidly laying hands upon a supply of this serum makes highly desirable the preparation of serum which can be stored *in vitro* for long periods. F. M. Burnet and J. Macnamara¹³ have demonstrated by animal inoculation that human immune serum can be stored and kept at ice-box temperature for as long as three years without losing its therapeutic efficacy.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1911, lvi, 663; ²*Hyg. Lab. Bull.* 1918, No. 11; ³*Proc. Soc. Exper. Biol. and Med.* 1930, xxvii, 742; ⁴*Jour. of Prev. Med.* 1930, iv, 189; ⁵*Lancet*, 1930, ii, 895; ⁶*Jour. of Pathol. and Bacteriol.* 1930, xxxiii, 17; ⁷*Ibid.* 1929, 32, 457; ⁸*Amer. Jour. Child. Dis.* 1928, xxxvi, 40; ⁹*Arch. of Internal Med.* 1930, Jan., 102; ¹⁰*Jour. Amer. Med. Assoc.* 1929, Oct. 5, 1044; ¹¹*Med. Jour. of Australia*, 1929, Dec. 14, 838; ¹²*Jour. Amer. Med. Assoc.* 1929, Dec. 21, 1927; ¹³*Med. Jour. of Australia*, 1929, Dec. 14, 851.

POLYCYTHÆMIA VERA. (See ERYTHRÆMIA.)

POLYPOSIS OF THE COLON, MULTIPLE. (See COLON, MULTIPLE POLYPOSIS OF.)

POTT'S DISEASE. (See TUBERCULOSIS, SURGICAL.)

PREGNANCY AND ITS DISORDERS.

Beckwith Whitehouse, M.S., F.R.C.S.

The Relation of Maternal Mortality to Contraceptional Methods and Abortion.—According to M. Walthard,¹ the highest percentage of maternal mortality in Germany is due to the struggle against maternity with dangerous methods, either by the women themselves or by other individuals who do not belong to the medical profession, and even “by conscienceless members of the medical profession”!

In view of the existing present-day use of contraceptive methods, the following table compiled by A. Reist, of the Gynæcological Clinic of Zürich, indicates only too clearly the risks which women incur by the introduction and the wearing of instruments in the uterus. Various objects are apparently used—e.g., ‘brushes’, ‘sterilets’, ‘obturators’, and ‘intra-uterine pessaries’.

| | Cases | | Cases |
|--|-------|---|-------|
| Death by peritonitis .. | 17 | Intermenstrual hæmorrhage .. | 60 |
| General peritonitis (non-fatal) .. | 38 | Menstrual colic .. | 28 |
| Localized peritonitis (non-fatal) .. | 6 | Ulcerative perforation of instrument through— | |
| Pyosalpinx and ovarian abscess .. | 17 | Uterine wall .. | 5 |
| Uterine pregnancy whilst wearing instrument—puerperal infection .. | 62 | Vaginal wall .. | 1 |
| Tubal pregnancy .. | 4 | Urinary bladder .. | 1 |
| Inflammation of the uterus .. | 78 | Intestines .. | 2 |

The publication of this list of fatal and serious complications recorded in gynæcological literature should damn for all time the pernicious practice of the introduction of foreign bodies into the uterine cavity for the sole purpose of preventing conception. Apart from the risk to life from peritonitis and suppurative conditions in the Fallopian tubes and ovaries, it is particularly interesting to observe that Reist publishes records of sixty-two cases where pregnancy actually occurred whilst the instrument was still *in situ*.

The mortality from criminal abortion in Germany to-day is, according to Walthard, a very serious matter. Liepmann (Berlin), quoted by the author, is of opinion that 1 per cent only of abortions is due to real disease of the ovum. Other authors, basing their figures upon actual statements by the patients, calculate that abortifacient methods are the cause of abortion in from 60 to 80 per cent of cases. The frequency of abortion in Germany to-day varies around 500,000 cases per annum, and, if Walthard's figures are correct, it means that about 15,000 women die a year through the consequences of provoked abortion. More exact figures relating to criminal abortion are furnished in Germany than elsewhere, but what obtains in that country very possibly is existent in other European centres.

The Zondek-Aschheim Test for Pregnancy.—The necessity for an accurate and simple clinical test for the early diagnosis of pregnancy will not be disputed. Various biochemical and biological tests for the purpose have from time to time engaged the attention of the medical profession, but for various reasons have received no practical application. The Abderhalden test, quite apart from the difficulty of obtaining certain materials—e.g., blood-free placenta—is not sufficiently reliable in its results. The latter remark applies still more forcibly to the recently described Porges-Pollatschek skin test with anterior pituitary hormone. H. Strauss² and A. Deutsch³ have recently investigated this test and come to the conclusion that the skin test is neither definite nor accurate. It may therefore be entirely disregarded.

In the case of the Zondek-Aschheim reaction, however, a test is available for the diagnosis of pregnancy during the first few weeks which is apparently reliable in from 95 to 98 per cent of cases, and which therefore promises to have a definite clinical value. This test is based upon the occurrence in the urine

during pregnancy of large amounts of a sex hormone which normally is only present in the anterior lobe of the hypophysis. During pregnancy the hormone is present in and possibly produced by the chorionic villi in the placenta, and it is certainly excreted freely by the kidneys. The existence of the hormone is demonstrated by the production in virgin female mice of 'blood points' in the ovaries, due to growth-stimulating properties of the internal secretion and particularly the development of corpora lutea.

F. A. E. Crew and B. P. Wiesner established in 1929 at the Animal Breeding Research Department, Edinburgh, a Pregnancy Diagnosis Station, and Crew¹ has recently issued a report upon the first year's working. This is valuable as giving an indication of the reliability of the test and its value from a clinical standpoint.

The A.Z.R. test as carried out at Edinburgh corresponds closely to the original Aschheim and Zondek technique. The main difference is that microscopic examination of the mice ovaries is not considered to be necessary, as a minimum positive reaction produces 'blood-point' formations which are easily visible to the naked eye. By holding the ovaries up to the light, the blood may be seen even in the densest of corpora lutea. Crew considers the naked-eye technique to be not less accurate than the microscopic, and of course there is a great saving of time. If any doubt exists, a fresh specimen of urine should be obtained and the test repeated. The test on these lines actually takes about a hundred hours, and the result is dispatched to the sender at the latest within six days of the arrival of the specimen. By using larger amounts of urine it is possible in very urgent cases to obtain a positive result within sixty hours. The Edinburgh station, however, always controls these 'emergency' tests by carrying out a second test by the standard method.

When transmitting a specimen for investigation, it is essential that certain factors should be complied with. At least two ounces of fresh morning urine are required, and this should be forwarded in a sterile container together with a few clinical facts giving the patient's name, age, family, menstrual history, date of last menstrual period, and history of any severe constitutional disturbance. The last-mentioned, at first sight apparently unnecessary, is valuable in giving information as to certain causes of failure of the test. It must be remembered that the estimation of the value of the reaction from the clinical standpoint is still *sub judice*, and the biochemist should therefore work in the closest co-operation with the clinician. To mention one interesting point, it is established that in about 1 per cent of cases the sample of urine is lethal to the experimental animals. The cause may be evident in some instances, as, for example, when a patient is receiving antisyphilitic treatment. In other cases, however, the cause of the toxicity of the urine is by no means clear, partly owing to insufficiency of the clinical details submitted.

Crew and Wiesner's results as published from the inception of the 'station' up to the end of January, 1930, are sufficiently interesting to call for special comment. In all, 840 cases have been investigated. In 10 cases the urine was insufficient in amount, but in 830 tests were carried out. In 24 patients the urine was toxic and the test animals died. Of the remaining 806, confirmation as to the correctness or otherwise of the diagnosis was obtained in 460. These results are given as follows: Diagnosed at the station as: positive 286, negative 174. These have been controlled thus: correct 446, incorrect 14. The results show, therefore, an error of 3.04 per cent. This figure is, however, reduced to 2.2 per cent by the elimination of certain cases where data subsequently received showed that the ovum was dead at the time the test was made.

The reaction has been shown to be positive in cases of retained adherent

fragments of placenta, incomplete abortion, hydatidiform mole, and chorion-epithelioma. It is also present for a few days in normal parturition and complete abortion, and therefore has a possible medico-legal application. Dead placental tissue in utero is not associated with the production of a sex hormone, and therefore a positive result in a carneous mole is not to be expected.

There can be little doubt, therefore, from the report of the Edinburgh station that the Zondek-Aschheim reaction is the most reliable and useful test at present available for the early diagnosis of pregnancy. The average age of pregnancy in the cases diagnosed correctly was 69 days : 78 cases were within 60 days of the last menstrual period, and at least 2 were within 8 days of the first lapsed period. In 6 cases definite clinical details were available regarding coitus, and of these 5 were within 40 days and 1 within 28 days of the last act. From the clinical point of view it is perhaps unnecessary to stress the importance of referring specimens of urine for diagnosis to a laboratory where the workers are cognizant and experienced in the technical details associated with the performance of the test. Apart from the facilities required for keeping large numbers of mice, the animals selected for the test should be virgins of a certain weight and age, and at the early age required the sex is not always easy to determine.

(See also OVARIAN HORMONES ; PITUITARY GLAND.)

Perforation of the Uterus during Pregnancy by the Chorion.—A remarkable case of spontaneous erosion of the uterine wall by the placenta resulting in perforation of the fundus uteri, severe intraperitoneal hæmorrhage, and death, is recorded by M. Bolaffio.⁵ Instances of perforation of the uterus by 'malignant moles' are recorded from time to time, but in the case here described the patient, a 6-para, had reached the seventh month of her pregnancy, and apparently there was no evidence of hydatidiform degeneration, so called, in any of the chorionic villi concerned. The patient, age 38, was admitted to hospital on account of severe abdominal pain of sudden onset, the symptoms developing soon after the muscular exertion of running. The preceding pregnancy, two years previously, had ended in abortion, the placenta being delivered manually. Up to the time of the development of acute symptoms the present pregnancy, however, had pursued a perfectly normal course. On admission the patient was very pale, restless, dyspnoic, and pulseless. The uterus was contracted and the fundus could be felt half an inch above the umbilicus. Death occurred half an hour after admission whilst preparations were in progress for operation. At the autopsy a spontaneous laceration of the fundus uteri was found, the peritoneal cavity being full of blood. Several interesting factors were present. The musculature of the uterine wall was much thinner than usual. It is also reported that the muscle showed some necrosis and a decidual reaction. At the fundus where the perforation had occurred an old scar was present with hæmolytic infiltration. The uterine mucosa was here wanting and the chorionic villi had penetrated right through the wall. The author considers that the lack of decidual reaction on the part of the mucosa had led to perforation of the muscular wall by the villi. Bolaffio observes that it is impossible to say whether the scar in the uterine fundus where perforation had occurred was the result of old inflammation or of organization by a recent hæmorrhage. He apparently does not consider that it may have been traumatic and related to the previous pregnancies. The preceding gestation had certainly terminated in abortion and the placenta had to be manually removed. The actual perforating properties of the chorionic villi in this case were shown, however, by the fact that the wall of the uterus was histologically destroyed in places even though no rupture was visible to the naked eye.

The Effect of Irradiation of the Ovaries upon the Fœtus.—The possibility of injury to the embryo by means of the Roentgen rays has been suggested by various observers from time to time, and a certain amount of positive experimental evidence is available. The subject has recently been considered at some length by A. Kaplan,⁶ who reviews the available literature and quotes three cases in his own experience in which no ill effect was produced by previous irradiation of the ovaries by X rays. In the first case recorded, a stimulating irradiation was given a woman of 23 on account of "congenital atrophy of the uterus and dysfunction of the ovaries". The patient became pregnant seven weeks later and was delivered of a normal healthy child. The second case concerns a woman of 32 with a diagnosis of metro-endometritis. Irradiation was employed to produce temporary amenorrhœa, half a skin unit dose being administered to each ovary at a distance of 25 cm., covering a field 9 by 12 in. The filter consisted of 0.5 mm. zinc and 1.0 mm. aluminium. Pregnancy occurred three months later and was terminated by the normal delivery of a healthy child. The third case recorded by Kaplan is particularly interesting inasmuch as the pregnancy was terminated because of the fear that the fœtus might have been injured by irradiation of the spleen for myeloid leukemia. The patient was pregnant at the time of the irradiation. As a matter of fact the fœtus was found to be both macroscopically and microscopically normal.

These observations of Kaplan are important in proving that ovarian irradiation is not necessarily injurious so far as the embryo is concerned. Stimulating doses of X rays have frequently been given in recent years with good results in cases of amenorrhœa and sterility caused by ovarian dysfunction and defective ovulation. Kaplan's paper is therefore of interest in this connection.

REFERENCES.—¹*Jour. of State Med.* 1929, Dec., 710; ²*Amer. Jour. Surg.* 1930, June, 1271; ³*Zentralb. f. Gynakol.* 1929, Nov. 16, 2920; ⁴*Brit. Med. Jour.* 1930, i, 662; ⁵*Riv. Ital. di Ginecol.* 1929, viii, 683; ⁶*Ginek.*, 1928, vii, 563.

PRE- AND POST-OPERATIVE TREATMENT.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Sterilization of the Skin.—G. W. Raiziss, M. Severac, and J. C. Moetsch¹ seem to make a good case for the disinfection of the skin and hands of the surgeon with solutions of **Metaphen**. Since, to be really effective in surgical work, an antiseptic must render the skin sterile in a period as short as five

PERCENTAGE OF CASES OF COMPLETE STERILIZATION IN
FIVE-MINUTE INTERVALS.

| ANTISEPTIC | NO. OF TESTS | PERCENTAGE |
|--|--------------|------------|
| Iodine (7 per cent) | 10 | 70 |
| Mercurochrome (alcohol-acetone-water) (2 per cent) | 16 | 50 |
| Metaphen, 1-500 | 3 | 100 |
| Metaphen, 1-1000 | 3 | 100 |
| Metaphen, 1-2000 | 2 | 100 |
| Metaphen, 1-2500 | 10 | 100 |

minutes, they compare the percentages of cases of complete sterilization for the five-minute interval, with the three most commonly used antiseptics—iodine, mercurochrome, and metaphen (*see Table*). It is thus seen that metaphen alone gives complete sterilization at the end of five minutes, and in any dilution up to 1-2500 (0.04 per cent). While some authors, in estimating

the efficiency of an antiseptic, consider the decrease in the number of micro-organisms as an indication of germicidal action, their sole criterion was complete sterilization of the infected skin. It is their contention that only the antiseptic which has survived the most rigid test which it is possible to impose is to be considered safe for use in any and all cases that may arise in practice. Their conclusions are as follows: (1) The method presented in their paper for estimating the efficiency of an antiseptic has as its basis the sterilization of the infected skin. Only an antiseptic which passes the most rigid test is to be considered safe for use in all clinical cases in which a germicide is to be applied. (2) Considered from this point of view, ethyl alcohol, which is used extensively, is disqualified as a skin disinfectant. (3) A solution of hexyl-resorcinol 1-1000 (S.T. 37) gave growths of bacteria in all tests. (4) Acriflavine base was found to be efficient in the 2 per cent concentration, resulting in sterilization in 80 per cent of cases. (5) It is important to note that a 5 per cent solution of iodine is ineffective and a 7 per cent is effective in 88 per cent of cases. (6) Two per cent mercurochrome-alcohol-acetone-water solution showed only 79 per cent efficiency. (7) An aqueous solution of metaphen 1-2500, or 0.04 per cent, produced sterilization in all of the fifty tests performed. (8) Metaphen proved to be efficient in very high dilutions. Thus a 1-2500 dilution of it was found to produce 100 per cent sterilization, while 7 per cent iodine and 2 per cent mercurochrome sterilized at five-minute intervals to the extent of 70 per cent and 50 per cent respectively. This indicates that better results were obtained with metaphen in dilutions 175 and 50 times greater than those employed for iodine and mercurochrome respectively.

Coagulation of the Blood.—It is frequently necessary to operate on those suffering from jaundice or patients who have a history of bleeding. The anxiety of the surgeon in such cases is increased, and his main efforts are directed to preventing post-operative hæmorrhage or undue bleeding at the time of operation. Walters, of the Mayo Clinic, has shown that an injection on three consecutive days immediately before operation of 5 c.c. of a 10 per cent solution of **Calcium Chloride** considerably lowers the coagulation time of the blood. Intramuscular injections of 30 c.c. of a 30 per cent solution of **Sodium Citrate** produces a somewhat similar effect, but is a painful procedure, the pain lasting for many days after the introduction of the citrate. Small **Transfusions of Blood** also improve the clotting time. These three measures have been frequently employed by the reviewer, and in his experience they are more efficacious than horse serum or other similar remedies.

I. S. Ravdin, C. Riegel, and J. L. Morrison² allude to the comparative values of **Calcium** and **Glucose** as agents for decreasing the clotting time. They refer to other writers who emphasize the fact that coagulation time is not a prognostic index to be depended upon. They also point out that, although the use of calcium has become widespread, calcium deficiency in obstructive jaundice had not been found. They consider that, since glucose causes rapid liver repair, it might be supposed that improvement of liver function after its use would reflect itself in a number of ways. There can be little doubt that the administration of glucose has been a major factor in the reduction of the surgical mortality attending operative procedures for obstructions of the common duct. With an increase in the blood-sugar there is a decrease in the coagulation time. In conclusion, these writers believe that glucose given by the mouth or intravenously does favourably effect the coagulation time in obstructive jaundice when the liver damage is not beyond the stage of partial repair.

Reactions after Blood Transfusions.—Transfusions of blood are resorted to in preparing bad surgical risks for operation, as a safety measure after

prolonged operations, and in desperate cases as a last resort. A bad reaction after transfusion may be the immediate cause of death. If a patient, after blood transfusion and when all possible precautions have been taken by way of blood-testing and slow administration, gets a reaction, a second blood transfusion should not be given if avoidance is possible.

O. A. Brines³ is impressed by the rare occurrence of death immediately following and directly attributable to blood transfusion. All surgeons are similarly impressed, but it must be remembered that, although a moribund patient will not survive a bad reaction, the transfusion, if it is successful, may well be life-saving. Brines classifies post-transfusion reactions as follows: (1) Those due to incompatibility; (2) Chemical reactions; and (3) Allergic reactions. In a series of 4000 cases incompatible blood was transfused in 6 instances owing to technical errors. No fatalities occurred in 4 cases, and in the other 2 the patients were in a moribund state before the transfusion. The danger of using an incompatible donor is most serious when the patient is unconscious or semi-comatose, because then a large amount of blood must be given before the operator realizes the situation. A reaction usually occurs before 50 c.c. has been given. There is lumbar or abdominal pain associated with dyspnoea and cyanosis. Brines thinks it is quite safe to use universal donors. Group IV blood is the safest because the cells are not agglutinable by any agglutinins. He also states that once a donor is properly typed there need be no apprehension of his group's changing.

Chemical reactions are caused by some anti-coagulant or some chemical contamination from rubber tubing. The reviewer believes that it is the sodium citrate and not the tubing which produces the reaction in some cases. He has seen a reaction when citrated blood was given on more than one occasion to the same patient after careful grouping, but there was no reaction when unmodified blood was used. The speed and temperature at which the blood is given require careful consideration. The so-called anaphylactic reaction is not clearly understood. Brines describes two deaths after transfusion: the first occurred ten hours after a severe reaction; in the second case, about two minutes after the transfusion was finished the patient suddenly gasped, became cyanotic, and died. The reaction was explosive in character.

Shock.—C. A. Johnson⁴ recommends the use of **Ephedrine Sulphate** in the treatment of acute shock from trauma or hæmorrhage. Ephedrine is used now almost as a routine in combination with spinal anaesthetics to prevent the disturbing fall of blood-pressure when this method is employed. In the treatment of shock from trauma or hæmorrhage it is of doubtful value when used orally, but used intravenously the effects have been on the whole satisfactory. After an intravenous injection of 15 mgrm. of ephedrine sulphate there is a sharp rise in the blood-pressure to above normal. This subsides to slightly below the normal level, but a reasonable blood-pressure is maintained for many hours.

L. D. Huffman⁵ advocates the intravenous administration of a solution of **Acacia and Sodium Chloride** in hæmorrhage and shock. It should not be administered faster than 20 c.c. a minute at a temperature of 100° F.; 800 c.c. is the maximum dose. The chief drawback to the method recommended is the difficulties in the preparation of the solution. The details are given in a very instructive paper, of which the following is a summary. Gross evidence of toxicity was not seen following the intravenous injection of solution of acacia and sodium chloride in shock. The blood-pressure increased, the pulse-rate decreased, the respiration deepened, and the general condition of the patient improved. The need for transfusion was often obviated. In some cases increased output of urine was noted. Injurious effects on the kidneys were

not seen. Chemical changes in the blood of a harmful nature were not apparent. Physicochemical changes in the blood did not lead to harmful alterations in physiologic processes. Six days are usually required to rid the blood of acacia. Pathologic change resulting from the acacia was not demonstrated at necropsy. The therapeutic usefulness of solution of acacia and sodium chloride is confirmed.

Venoclysis.—G. A. Hendon⁶ describes experiences with venoclysis, by which he means intravenous medication in general. Venoclysis, he claims, renders one entirely independent of the gastro-intestinal system so far as nutrition is concerned. He introduces a cannula perforated at the sides only and made of silver. The technique is to expose either the basilic or the cephalic vein (preferably the former) immediately above the bend of the elbow under local anæsthesia after a tourniquet has been applied to the arm above. A piece of tape is carried under the vein with an aneurysm needle. The distal end is tied, the vessel wall is then picked up, the tourniquet loosened, and the vein wall opened with manicurist scissors. The cannula is introduced and the vein tied around it. A sterile gauze dressing is applied over the incision, and the tubing connected to the cannula is bound tightly to the forearm with strips of adhesive plaster that encircle the limb at intervals down to the wrist. A loop of muslin bandage is carried lightly around the wrist and tied to the bed-railing to prevent damage being done by involuntary movements during sleep. Splinting is not necessary. The apparatus for holding and conveying the fluid consists essentially of two thermos bottles hung at a convenient height. The fluid is allowed to trickle in through a Murphy visible dripper. When not in use flasks are kept full of Dakin's solution as they cannot be boiled. The rate of the flow is regulated so that the patient, if an adult, receives not less than 4000 c.c. of 10 per cent dextrose in twenty-four hours. The urine output in most cases is approximately half the amount of fluid administered. **Ringer's Solution, Fischer's Solution, Normal Saline, Dextrose** in normal saline and dextrose in plain sterile water have been used. The method is safe, simple, and accurate. The fluid should be delivered into the vein at a temperature of 100°. To accomplish this it should be placed in the thermos at 120°. There is a loss of about 5° in transit for each foot of tubing traversed. In case of bad shock the fluid can be supplied to the blood at 120°, without hæmolysis, and thus body heat is restored. On the other hand, the fluid can be administered at room temperature, or as low as 60°, to control excessively high temperatures. The rate of administration should be about 150 to 200 c.c. an hour. Increased lacrimal secretion or œdema of the lids is regarded as evidence of saturation. If dextrose is being given, the urine is examined daily, and as long as only a trace of sugar appears the administration is not disturbed, but otherwise the concentration is diminished. Hendon has given 600 gm. of dextrose in eighteen hours in a severe case of septicæmia, and 500 gm. daily for five days in pernicious vomiting, without any glycosuria, but with immense relief of pain and much benefit to the patient. On the other hand, in a case of gastric ulcer, 250 gm. daily was followed by sugar appearing in the urine in 1 or 2 per cent proportions. He does not regard glycosuria as a danger signal, but no useful purpose can be accomplished by producing an excess. Neither air embolism nor clot nor phlebitis has occurred during the employment of the venoclysis. The method has been most successful in cases of emesis gravidarum. It is recommended also in late cases of intestinal obstruction, and it is claimed that thirst is allayed, nutrition is supplied, the heart action slowed and strengthened, delirium quietened, and the action of the kidneys maintained. When the fluid is administered by venoclysis drop by drop it is free from intolerance. It is distributed and

consumed at a rate proportionate to its delivery, and imposes no sudden or excessive demands upon the vital functions.

P. Titus⁷ stresses the pre-operative and post-operative therapeutic use of **Dextrose**. The underlying fundamental principle is to supply the patient with food and water in such a form and by such a route that these are immediately available to the starved and thirsty tissues. He urges slow administration to avoid undesirable consequences. Fast administration disregards the strain on the renal threshold, the wasteful spill of sugar through the urine, the hyperinsulinism from overstimulation of the pancreas, and many other disadvantages. Insulin is not recommended and is not required if the dosage and rate of administration are properly regulated.

Dextrose and Glucose.—Originally the word 'glucose' was synonymous in a chemical sense with dextrose, but glucose as sold over the counter still contains various impurities, and reactions, and even deaths, have followed its intravenous use. Dextrose, on the other hand, is prepared and purified so that it can be used for all therapeutic purposes. One should speak now only of 'dextrose' in referring to the medicinal agent. To avoid reactions, freshly distilled and immediately sterilized water should be made use of. The solution should not be given rapidly or too cold or in overdose. Dextrose given subcutaneously regardless of concentration is not in itself especially irritating. If too much is given, pressure necrosis may follow. Alkalis should not be added as they cause a rapid disintegration of glucose or dextrose when heated. Sodium bicarbonate has no place in combination with dextrose solution for intravenous injection, nor should the combination be used for subcutaneous infusion.

Most authorities appear to think now that intravenous transfusions should be given at the rate of one drop per patient's pulse-beat. For single doses 300 c.c. of a 25 per cent solution is recommended in the average case. The effects of the hypertonic solutions seem more prompt and more pronounced. A 15 or 10 per cent solution may be used (500 to 750 c.c. respectively) if more water is required. For prolonged venoclysis the solution should not be stronger than 5 per cent, but this injection may be continued even for days at the rate of 5 or 6 c.c. per minute.

Post-operative Lung Complications.—Post-operative *embolism and phlebitis* is discussed by R. H. Miller and H. Rogers.⁸ The large emboli which cause sudden death are casts of a long vein of considerable size. They do not usually arise from the site of operation, because even if this is above the diaphragm, the thrombus commonly forms in the iliac or the femoral vein. Incidentally, it is mentioned that the injection treatment of varicose veins has been responsible for 5 cases of embolism in 53,000 injections. Some of the main conclusions reached are as follows: (1) Fatal embolism is most common after abdominal and pelvic operations, but may follow procedures on the chest, extremities, or head; (2) The primary thrombus is usually in the iliac or the femoral veins; (3) There is great variation in the post-operative interval preceding the onset, the average being in the neighbourhood of ten days; (4) Fatal embolism may result from phlebitis, but it is rare.

One of the most important predisposing causes is slowing of the blood-stream because of the quiet recumbent position in bed. Massage, increase in body fluids, the use of **Digitalis** and **Thyroid Extract** are indicated as prophylactics. The paper refers to the operation for the removal of a clot from the pulmonary artery, and suggests that success in this operation necessitates a degree of preparedness and speed which is almost impossible of attainment. The reviewer is impressed with the increasing number of successes following this dramatic operation. Some years ago one of his cases developed massive pulmonary embolism and died, but she was in a moribund condition for twelve

hours before death actually took place. Operation might have been life-saving. In every hospital, especially those devoted to diseases of women, it would be wise to have an emergency outfit of instruments suitable for the operation of pulmonary embolectomy always at hand.

In a paper on the *effect of abdominal operations on the mechanism of respiration*, D. H. Patey⁹ makes special reference to pulmonary embolism and massive collapse of the lungs. In 1926, out of a total of 54,253 operations in the big London hospitals there were 50 cases of fatal pulmonary embolism, of which no fewer than 43 followed abdominal operations. It was not an operation in any special part of the abdomen, but abdominal operations generally, which showed this particular predisposition to thrombosis and embolism. There is probably no undue frequency following pelvic operations. The incidence is identical for operations for myomata of the uterus and for operations on the gall-bladder.

Massive Collapse of the Lung.—One or more lobes of the lung, previously well aerated, may suddenly in cryptic fashion lose their air content and collapse. This collapse produces all the clinical signs of consolidation. Respiratory distress coming on after operation or trauma, pain, and rapid pulse with some cyanosis suggest the condition. The temperature rises and a cough develops. The condition may terminate as rapidly as it commenced or recovery may take some weeks.

H. H. Murphy¹⁰ quotes Sir John Rose Bradford, who says that massive collapse is an unusual condition in which the lung, without the presence of any gross lesion (such as bronchial obstruction, pleural effusion, etc.) interfering with the free entry of air, becomes airless to a greater or lesser degree. This atelectatic collapse is quite different from collapse of the lung in pneumothorax. The lung does not leave the chest wall. It becomes smaller in size, and to compensate for this shrinkage the trachea, heart, and other mediastinal contents are displaced to the affected side. The diaphragm is also raised. Collapse occurs most frequently after operative treatment for inguinal hernia and appendicitis. A lobule, a lobe, an entire lung, or even both lungs may be involved, and this latter, of course, is immediately fatal.

Sir John Rose Bradford¹¹ describes the condition in detail. He states that the diagnosis is often difficult, especially as massive collapse sometimes occurs on one side of the chest after an injury to the other side, and sometimes a comparatively trivial injury. The diagnosis is generally arrived at by considering the physical signs—namely, the extreme immobility, the extreme displacement, together with the absence of marked symptoms. Extraordinary errors are liable to be made, as, for example, imagining that the mischief is on the opposite side of the chest to that on which it really is. The diagnosis of pneumothorax has been made as a result of mistaking the gastric resonance for air in the pleural cavity.

The mechanism of production is probably a reflex one. In discussing the reflex mechanism, Bradford asks, "Is it that the lung first of all becomes collapsed and then the chest wall, following it, becomes immobile? Or is it that the chest wall becomes immobile and, as a result of that, the lung collapses?" We know that, if you impede the respiratory movements or obstruct the bronchial tree, the rate of absorption of the air of the lung is extremely rapid. Thus there is no particular difficulty in understanding that collapse of the lung can be brought about by any mechanism which renders the chest immobile. The whole question appears extremely obscure. C. G. Dyke and M. C. Sosman¹² discuss the postural treatment of post-operative massive atelectatic collapse. They come to the following conclusions: (1) Obstruction to the air-passages is absolutely essential for the production of the disease.

Thick tenacious mucus is the obstructing material. (2) Usually many secondary factors are involved in the production of the disease, i.e., lowered vital capacity, raised cough reflex, lack of frequent postural change during and after operation, and limitation of thoracic and abdominal mobility due to the operation. (3) The disease is not a reflex nervous phenomenon. (4) It does not occur contralateral to the side operated upon unless the patient lies on his side during operation, as in renal operations. (5) The Sante manoeuvre is very efficacious in treating the disease. (6) Hyperventilation of the lungs with carbon dioxide and oxygen should be employed at the end of operation and during the first forty-eight hours after operation. (7) Frequent changes of posture should be made during the first few days after operation, and sedatives should be curtailed. (8) The mortality from the disease is very low.

TREATMENT.—The *postural* treatment, as first advocated by Sante, is simple, safe, and can be carried out by anyone, anywhere. It consists in turning the patient so that the sound lung is dependent, the patient being in a horizontal or slight Trendelenburg position, the latter in case either of the lower lobes is involved. The patient should be kept in this position for a short time, encouraged to cough gently and to breathe as deeply as possible. Gently rolling the patient from side to side or light manual percussion over the involved area may be of considerable assistance in raising mucus. This procedure may be repeated at intervals as often as is necessary, but the patient should not be kept in this position for any length of time as the disease may shift to the dependent lung. (*See also* LUNG, MASSIVE COLLAPSE OF.)

Post-operative Salivary-gland Infections.—F. D. Jennings¹³ draws attention to this subject. Speculation continues as to whether the infection is hæmatogenous, ascending (via salivary ducts), traumatic (by anæsthetist), or lymphatic. The preponderance of evidence leans to the first two. Post-operative patients generally suffer from dry mouths and some degree of salivary stasis, if not oral sepsis. The parotids are more often affected than the sublingual and submaxillary glands. The secretion from the latter is more bactericidal than that of the parotids, and the ducts of the former open under and are kept clean by the movements of the tongue. Stenson's duct opens outside the alveolar process near the molar teeth, which are frequently carious. The rapid onset after operation and the associated septic symptoms point more to a hæmatogenous source. The diagnosis offers no difficulty as a rule. A tense, tender swelling develops in front of either ear, and the skin is red. The swelling is painful. There is a rise in temperature, with associated prostration and discomfort. Such is the familiar picture of acute parotitis.

TREATMENT.—Prophylactic treatment emphasizes the necessity of adequate oral hygiene before and immediately after operation. Careful cleansing of the mouth, keeping the oral mucosa as moist as possible, postponing elective operation in the presence of bad oral hygiene are all-important. Once it develops, **Iodine** and **Ice** locally are useful, **Chewing-gum** or **Acidulous Lozenges** (lime or lemon) are helpful in stimulating a flow of saliva. The free intake of fluids is essential, and in bad cases hypodermoclysis is beneficial. If pus forms, obviously drainage is necessary. Incision may be made at the level of the angle of the inferior maxilla, keeping in mind the location of the facial nerve. It should preferably be horizontal, and once the dense sheath is opened, the gland proper may be entered with a blunt forceps.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, April 19, 1199; ²*Ann. of Surg.* 1930, June, 801; ³*Jour. Amer. Med. Assoc.* 1930, April 12, 1114; ⁴*Ibid.* May 3, 1388; ⁵*Ibid.* 1929, Nov. 30, 1698; ⁶*Ann. of Surg.* 1930, May, 753; ⁷*Amer. Jour. Surg.* 1930, June, 1196; ⁸*Jour. Amer. Med. Assoc.* 1929, Nov. 9, 1452; ⁹*Brit. Jour. Surg.* 1930, Jan., 487; ¹⁰*Canad. Med. Assoc. Jour.* 1930, March, 327; ¹¹*Lancet*, 1930, i, 331; ¹²*Surg. Gynecol. and Obst.* 1929, Dec. 752; ¹³*Amer. Jour. Surg.* 1930, June, 1201.

PROLAPSE OF RECTUM. (*See ANUS AND RECTUM ; RECTUM, PROLAPSE OF.*)**PROSTATE, DISEASES OF.***Sir John Thomson-Walker, F.R.C.S.*

Obstructive Lesions.—J. R. Caulk¹ describes his **Cautery Punch Operation** for 'obstructive lesions of the prostate' and discusses its influence in decreasing the necessity for prostatectomy. His results, he states, indicate that his operation can cure at least 85 per cent of the 'obstructions' to which it is applied. At first it was applied to 14 per cent of 'bar' and 'contracture' cases only; a few years later he was using it in 30 per cent of all obstruction cases; two years ago in 40 per cent; from 1927-8 in 70 per cent; and last year in 85 per cent of all 'obstructions' resulting from enlargements of this gland.

He states that, "by carefully observing the obstruction before operation, studying the tissue removed at operation, and watching the transformation in the gland thereafter", he has become convinced that the majority of the obstructive lesions result from chronic inflammation or cancer. He further states that the chief factor in securing a result is to be convinced that the growth can be removed, and not to be discouraged if one, two, or three operations do not effect a cure. Some of his best results have occurred after the fourth or fifth operation when there had not been any previous improvement. Many of these patients were extremely bad risks and such as would not stand a major operation with any degree of safety.

Of 510 operations performed with the cautery punch, only 13 patients had hæmorrhage sufficient to give concern. If a large catheter, from 26 F. to 30 F., with two eyes, is tied in after operation and the bladder irrigated periodically, there is little trouble from bleeding, although all patients have a slight staining of the urine. Hæmorrhage has never been sufficiently severe to require suprapubic cystotomy, and in only a few instances has evacuation of clots with a Bigelow's evacuator been found necessary. Chills and fever have rarely occurred. In all there have only been 25 patients of the 510 who had reactions following the operation, and practically all these reactions occurred in patients who had previously been suffering from pyelonephritis. In only one instance was drainage necessary.

Perineal Prostatectomy.—F. Hinman² describes in detail the technique of perineal prostatectomy. He states that the theoretical advantages of this operation over the suprapubic operation are that: regional anaesthesia is more satisfactory by way of the perineum; complications and dangers of infection are less; and there is less danger of injury to the peritoneum and of complications arising from infections of the prevesical space. He states, however, that the suprapubic route rivals perineal surgery only when the open visual operation of Thomson-Walker or Hunt is performed, but neither of these, he considers, can be done by a two-stage method. The perineal route, he says, allows of better control of hæmorrhage because of its being a more open visual operation, and because of the more direct access for packing when required. Dependent urinary drainage is also obtained, although Fullerton has recently advocated drainage by the perineum after suprapubic prostatectomy. The writer further considers that, because there is less shock, poorer risks can be subjected to the perineal operation with an easier convalescence, as shown by the fact that recent statistics give the mortality of the perineal route as being at least 50 per cent less than that following the suprapubic operation, the average mortality being about 3 per cent for the perineal as compared with 6 per cent for the suprapubic route in the hands of those most experienced in either method. The very practical disadvantages of the perineal method are: the greater difficulty of its performance; the greater possibility

of poor urinary control afterwards; and the danger of producing a rectal fistula. Unless the last two dangers can be prevented, the perineal route should be abandoned, in view of the marked advance in the technique of suprapubic prostatectomy; but Hinman is of opinion that if surgeons could be certain of not injuring the external sphincter of the bladder, or the rectum, the perineal route should be that of choice.

A. B. Cecil³ reports a series of 224 cases operated upon for benign enlargement of the prostate, 209 of which were dealt with by Young's perineal method, with, he states, a mortality of 1.5 per cent. He emphasizes the importance of preliminary drainage of the bladder in all cases in which prostatectomy is contemplated.

E. G. Crabtree⁴ reports his results in 15 cases of total excision of the fibrous prostate by the perineal route. In 9 of these suprapubic cystotomy was performed for purposes of drainage preliminary to prostatectomy, and in 6 preliminary drainage was carried out by means of an indwelling catheter. There was no operative mortality, and the average day after operation when the patients began to pass water was the fourteenth. Bilateral vasoligation was done in all the cases.

T. E. Gibson⁵ states that in performing perineal prostatectomy it is generally possible to get an adequate view of the neck of the bladder, and considers that, with practice, one can close the majority of wounds without either packs or bags. In a consecutive series of 20 perineal prostatectomies he has been able successfully to carry out a primary closure of the wound in 13 cases. In the remaining 7 he had to resort to packing to check the bleeding. In the cases in which packs were used the average stay in hospital was twenty-two days, whereas after primary closure of the wound the average stay in hospital was sixteen days.

Enlarged Prostate and Prostatectomy.—In the Lettsomian Lectures for 1930 Thomson-Walker⁶ discusses this subject. The fibrous prostate and some forms of malignant prostate are specially examined. The term 'fibrous' prostate included a number of different pathological conditions. In 44 cases of supposed fibrous prostate weighing 20 grm. or under, the microscopic reports were: adenocarcinoma 1, adenoma with little change in the stroma 14, adenoma with amyloid bodies 3, hyperplasia of the stroma 5, chronic prostatitis and fibrosis of the stroma 14, and multiple small calculi 7. Previous clinical examination of the patients concerned had given no definite indication as to the nature of the change in the prostate. Another type of fibrous prostate was that in which fibrosis of the stroma and adhesion of the gland have resulted from the application of previous treatment, such as deep X-ray therapy, to an adenomatous prostate.

In these cases enucleation was as a rule relatively easy in the adenomatous type when an intravesical projection was present; but in the majority of those in which no intravesical projection existed, and in cases of fibrosis with or without calculi, removal of the prostate by dissection was usually necessary.

As regards the malignant prostate, two clinical forms are distinguished—the primary, in which the change in the gland is cancerous from the outset, and the secondary form, in which malignant changes develop in the ordinary benign enlargement. The proportion of primary malignant prostates to simple enlargements in the author's private practice was about 1:6 (347:2149). Patients suffering from the secondary form of malignant prostate come under observation for symptoms of benign enlargement, and in these the malignant growth may have developed in one of three localities: (1) The base of the prostate in the neighbourhood of the internal urinary meatus, when it may only be discovered at operation; (2) The periphery of the enlarged gland,

when the enucleation is found to be difficult at the site of malignancy and not infrequently a leathery plaque may be left in the wall of the prostatic bed; (3) The malignant change may develop in the substance of the enlarged prostate, and the clinical features and the ease of enucleation raise no suspicion of malignancy, but histological examination shows that there are one or more areas of a malignant nature. Of 521 cases in the author's private practice there were 96 cases (18 per cent) in which such areas of carcinoma were discovered microscopically, there having been no suspicion of malignancy before operation or during enucleation of the gland. Albarran and Hallé have reported 100 cases of benign enlargement in which 14 came into this group; Wade 134 with 14; and Swan 20 with 4. Thus, in all, a series of 783 cases of apparently benign enlargement has been found to contain no fewer than 126 cases (16 per cent) in which microscopic evidence of carcinoma of the third type was present. The prognosis in these cases is important, and of the 96 cases in the author's series 13 died within a year of operation from other diseases, 17 were not traced, 41 are alive without recurrence, 23 are dead without evidence of recurrence, and 2 have died with recurrence. The author finds that of the 66 cases traced for a period of from one to seventeen years there were only 2 (3 per cent) in which the malignant growth recurred in cases of the third type of secondary malignancy submitted to operation.

In discussing the selection of cases for operation, the author considers in detail the urea-concentration test, which in a series of 274 cases operated upon was found to give the following figures: 2 per cent and over, 194 cases with no death from uræmia; 1.8 to 2 per cent, 21 cases with 1 death (4.7 per cent) from uræmia; 1.5 to 1.8 per cent, 34 cases with 3 deaths (8.8 per cent) from uræmia; and 1.0 to 1.5 per cent, 25 cases with 3 deaths (12 per cent), 2 of these deaths being after cystotomy alone and 1 after a two-stage prostatectomy. Of the 22 survivors with a urea-concentration figure of 1.5 or under, in 3 preliminary cystotomy was followed by prostatectomy after the urea-concentration figure had risen to 2 per cent or over. In 10 the urea-concentration figure remained at 1.5 or under after suprapubic cystotomy, but prostatectomy was subsequently performed with success; and in 9 cases, after preliminary drainage by the indwelling catheter, a single-stage prostatectomy was subsequently performed with success. The author concludes that risk of uræmia is negligible if the urea-concentration figure is 2 per cent or over, that there is a slight risk if it is below 2 per cent but over 1.8 per cent, and that there is a very serious risk when the figure is below 1.8 per cent.

Estimation of the blood-urea (normal content 20 to 40 mgrm. Hg per 100 c.c., and perhaps in elderly men 40 to 50 mgrm. per 100 c.c.) is of use to the surgeon only in cases of advanced renal disease. Furthermore, a very low protein diet may so reduce the blood-urea as to make the estimation worthless, and a patient may die of uræmia and yet have a low blood-urea figure. On the other hand, it is possible for the blood-urea to be very high and yet the patient to be in no danger of uræmia. In most cases, however, the urea content of the blood varies inversely to the percentage of urea secreted in the urea-concentration test, and, as the range of figures is wider, the test is more sensitive to temporary variations in the renal function if sources of fallacy such as diet and fluid intake are controlled. Observation of the blood-urea content is invaluable in following the progress of a case in which the bladder has been drained for chronic retention with serious renal inefficiency. It must be remembered that the laboratory figures of the urea-concentration test and the blood-urea estimation form only one factor among many in estimating the prognosis for operation in prostatic cases.

The other important complication affecting the urinary tract is sepsis, which

may occur before operation, at operation, or during the subsequent after-treatment. Recent or moderate pre-operation infection without renal involvement is usually well controlled by bladder irrigation and removal of residual urine, either by intermittent catheterization or by the indwelling catheter, together with diuresis and the administration of urinary antiseptics.

Severe sepsis calls for suprapubic drainage and lavage before prostatectomy is contemplated, decision as to operation being difficult. Sepsis confined to the bladder usually clears up quickly with drainage and constant irrigation.

In the presence of pyelitis or pyelonephritis, however, although the general condition will usually improve somewhat with bladder drainage, the question of prostatectomy must be based upon the consideration of: (1) The general condition of the patient; (2) The condition of the urine; (3) The renal function tests; and (4) The cholesterol content of the blood. As regards the last, the author, as the result of observations on fifty patients submitted to prostatectomy in whom estimations of cholesterol content were carried out, considers that the test of the resistance to sepsis has not yet been brought to the level of reliability that the blood-urea and urea-concentration tests have reached in relation to renal efficiency.

The influence of disease of the cardiovascular and nervous systems and of glycosuria on prostatectomy is fully discussed.

Early operation and pre-operative treatment are advocated. The author describes his method of 'open' prostatectomy together with his routine post-operative treatment in detail, the objects of which are—the control of bleeding, the avoidance of sepsis, and the prevention of post-operative obstruction. The surgical accidents and complications of prostatectomy are set out in the causes of death in 269 cases of suprapubic prostatectomy for simple enlargement performed at St. Peter's Hospital, London, between 1901 and 1929 inclusive. They are shock 25, cardiac failure 32, hæmorrhage 7, uræmia 67, pyelonephritis 53, pelvic cellulitis 3, septicæmia 7, pneumonia 23, bronchitis 5, cerebral hæmorrhage 4, coronary thrombosis 1, venous thrombosis 1, pulmonary embolism 20, acute dilatation of the stomach 1, intestinal ilcus 2, general debility 10, acute mania 2, epidemic influenza 4, and pancreatitis 2. It will thus be seen that 165 (70 per cent) deaths were due to shock, renal failure, and sepsis, and that hæmorrhage accounts for only a small number (2·6 per cent), although it was probably a contributory factor in other fatal cases such as some of those from general debility. The avoidable causes of serious hæmorrhage after prostatectomy are numerous. They include: (1) Insufficient precautions at the time of the operation; (2) Sepsis; (3) Injudicious and unskilful instrumentation of the urethra during the first week or ten days after operation; (4) Overdistension of the urethra or bladder by injudicious methods of irrigation; (5) Distension of the rectum by large enemata during the first week after operation; (6) Straining and undue exertion on the part of the patient; and (7) Delay in treating a moderate hæmorrhage. The mortality of suprapubic prostatectomy is shown in statistics obtained by the author from eleven of the large general hospitals throughout the country from 1918–28 inclusive; also from statistics from St. Peter's Hospital, London, which is entirely devoted to the treatment of surgical diseases of the urinary organs, from 1901–29 inclusive; and finally from statistics obtained from the author's own private practice from 1919–29 inclusive. In the general hospitals there were 3451 operations for simple enlargement, with 675 (19·5 per cent) deaths; at St. Peter's Hospital there were 2691 operations with 268 (9·9 per cent) deaths; and in the author's private practice there were 472 operations with 25 (5·2 per cent) deaths. There is thus a distinct difference between the mortality in a general hospital and that in a special

hospital, and a more marked difference in the mortality in the case of hospital patients and that of private patients, the last difference being probably due to the fact that hospital patients are, as a rule, submitted to operation at a later stage of the disease, and infection of the urinary tract is more frequently present before operation. It is probable that the cases in a special hospital, taking them as a whole, are slightly greater surgical risks than those treated in a general hospital, for the reason that the cases that are considered hopeless elsewhere are usually referred to the special hospital.

The question of the failures of prostatectomy due to sepsis and obstruction is discussed in detail.

A. H. Peacock⁷ reports 117 cases of enlargement of the prostate in his private practice which were submitted to prostatectomy, with a mortality of 6.8 per cent. Of these cases 60 were operated upon by the one-stage suprapubic route, 54 by the two-stage suprapubic route, and 3 by the perineal route. Of the deaths, 37.7 per cent were due to renal failure, 25 per cent to cardiac failure, and 25 per cent to pulmonary complications. Post-operative hæmorrhage, immediately after operation, occurred in 2 cases, in both of which Pilcher bags had been used but proved too small in each case. The bag was removed and replaced by gauze packing in the prostatic cavity. Secondary hæmorrhage occurred in 3 cases, coming on at the end of ten or fourteen days. They were not as severe as the primary ones and were easily controlled by packing.

Cancer of the Prostate.—G. G. Smith⁸ reports a series of 65 cases of carcinoma of the prostate. These he has separated into three groups according to the extent of the disease. The first group consists of those in whom the growth appears to be confined within the prostatic capsule, or at most to extend no farther than the vesicles. In this group it is theoretically possible to remove the entire neoplasm, and 29 of Smith's cases came within this category. The second group consists of patients in whom the growth is too extensive to allow of complete removal, but who show no evidence of metastases. Cure in these cases is impossible, the object of treatment being to relieve obstruction, if present, and to retard the progress of the disease when possible. There were 17 cases in this group. The third group consists of the advanced cases in practically all of which metastases can be demonstrated. The object of treatment in such is to make the patient as comfortable as possible—namely, to relieve obstruction and pain. There were 19 patients in this group. The writer discusses the various means of giving relief in cases of prostatic carcinoma, such as intermittent catheterization, suprapubic drainage, transurethral removal of obstruction by means of the prostatic punch, suprapubic prostatectomy, and perineal prostatectomy partial or total. The only operation that the writer considers to be worth while, provided the condition is diagnosed early, is **Total Perineal Prostatectomy**, to which 26 of the 29 cases in the first group were subjected. Of these, 3 died in hospital, 8 died after living an average of twenty-two months after operation, and 15 are still alive, the times which have elapsed since operation being: six years and over, 2; five years and over, 2; four years and over, 2; one year and over, 5; and from six to nine months, 4. In the 23 cases surviving operation, control of micturition was satisfactory and urinary obstruction afterwards rarely occurred. In the 8 that died soon after leaving hospital, death occurred from a general carcinomatosis, and from compression of the lower ureters by growth.

As regards **Radium Treatment**, the writer's experience is limited to 14 cases and is inconclusive, but he considers that radium should not be used in conjunction with perineal prostatectomy unless the dose is small and the radium implanted deep in the tissues.

Treatment by **Deep X-ray Therapy** was carried out in 25 cases, and the writer concludes that if metastases are not too widely spread and the patient's general condition is not too poor, X-ray treatment is of benefit in the large majority of cases. It relieves pain in the back and legs caused by metastases, and retards development of the growth, but in the writer's experience has never brought about a cure. It is, however, particularly suitable for cases in the third group in which the object of treatment is simply palliative.

Metastases in the author's series were noted as follows: to the spine alone, 7 cases; to the pelvis alone, 3; to the femur alone, 1; widespread bony metastases, 4; to the liver, 4; to the abdominal glands, 5; and to the inguinal glands, 1.

Tuberculosis of the Prostate.—O. S. Lowsley and J. Duff⁹ have collected 23 cases of tuberculosis of the prostate, of which 2 were at first thought to be primary lesions, but further examination has cast doubt on this belief. The age incidence varied from 24 to 69 years of age, the average being 32 years. Sixteen cases of the series had tuberculosis of the epididymis, in 2 of which there was severe involvement of the body of the testicle; 7 had tuberculous seminal vesiculitis; in 5 the kidneys, ureters, and bladder were involved; while obvious pulmonary tuberculosis was present in 2 cases.

It is seldom that removal of a tuberculous prostate is indicated, and evacuation of a tuberculous abscess in the gland is to be avoided when possible, as such a procedure is liable to be followed by sinuses which heal slowly or not at all. The writers keep all cases of genital and urinary tuberculosis under observation for a long period. The temperature is recorded and the weight observed; and instructions as to diet, exercise, rest, fresh air, sunlight, and other hygienic measures are carefully explained and enforced as far as possible.

Two parallel series of cases are being observed, one in which **Ultra-violet Ray Therapy** is being used, and the other in which graduated doses are being given of **Koch's Old Tuberculin**. As regards the tuberculin treatment, it is used in the belief that small doses, increased gradually at regular intervals, cause inflammatory reaction at the site of the disease, and thus promote fibrosis of the lesion. The clinical appearance of evidence of local or constitutional reaction is the guide to the dosage, the usual initial dose being $\frac{1}{10}$ c.c. of a 1-10,000,000 dilution of tuberculin, given subcutaneously.

A. E. Goldstein and B. S. Abeshouse¹⁰ review the literature and discuss prevesical, perivesical, and periprostatic suppurations following any operative procedure on the prostate and bladder and their associated structures. Inflammatory collections in this region are essentially of three types: (1) Intrafascial, occurring in any one of the various spaces situated between the true prostatic capsule and the different periprostatic fascial planes; (2) Extrafascial, occurring in the spaces external to these planes; and (3) Distant suppurations the result of extensions of the inflammatory process by way of the blood-stream, lymphatics, or by direct continuity from the focus of infection in the operative area.

Infection of the prevesical space is the most frequent complication of suprapubic cystotomy, and in most instances is due to a flooding of the field of operation with septic urine, either at the time of the operation or during convalescence. When infection has spread beyond this space, perineal approach is advocated as providing dependent drainage. The prevention of such complications demands scrupulous care in the prevention of sepsis before, during, and after operation.

Treatment after Prostatectomy.—L. P. Player¹¹ considers that, as yet, insufficient importance has been attached to the seminal vesicles and their ducts as possible sites of infection after prostatectomy. A direct extension of infection

from the prostatic bed to the seminal vesicles may occur. As regards treatment, in addition to general measures, he advocates gentle stripping of the seminal vesicles once a week, together with local instillations of 1 to 3 per cent **Mercurochrome**, or 1-5000 **Mercurophen**, or 10 per cent **Silver Protein**. The writer found seminal vesiculitis as a complication in 25 per cent of 60 carefully followed cases of prostatectomy.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, Feb. 8, 375; ²*Surg. Gynecol. and Obst.* 1929, Nov., 669; *California and West. Med.* 1930, Jan., 13; ³*Amer. Jour. Surg.* 1929, Dec., 795; ⁴*Ibid.* 1930, May, 958; ⁵*Ann. of Surg.* 1930, July, 82; ⁶*Lancet*, 1930, i, 1163, 1219, 1273; ⁷*Jour. Amer. Med. Assoc.* 1929, Nov. 2, 1359; ⁸*New Eng. Jour. Med.* 1930, April 17, 756; ⁹*Ann. of Surg.* 1930, Jan., 106; ¹⁰*Surg. Gynecol. and Obst.* 1929, Oct., 477; ¹¹*Jour. Amer. Med. Assoc.* 1929, Nov. 2, 1359.

PRURITUS ANI ET VULVÆ. (See also X-RAY THERAPY.)

J. P. Lockhart-Mummery, F.R.C.S.

Treatment by Subcutaneous Injection.—Several authors have reported the results of injection treatment for pruritus ani et vulvæ. In this country the solution that has been most used is **A.B.A. Solution**, which consists of: Anæsthesin 3 per cent, benzyl alcohol 5 per cent, ether 10 per cent, in sterilized olive oil. This is the solution recommended by W. B. Gabriel¹ and now in use at St. Mark's Hospital; another which has been used for the same purpose is **Benacol**. The technique of the injections is to get the solution into the subcutaneous space in a fan-shaped manner, about 2 to 4 c.c. being injected at one sitting; only a small area should be injected at a time. The injections are made once or twice a week till the whole pruritic area has been dealt with. Care must be taken not to produce sloughing or abscess of the skin. No serious complications have been observed, and the results are satisfactory in a considerable number of cases. The patient is, of course, not laid up at all. L. Goldbacher² uses a 5 per cent solution of **Phenolized Oil** and injects from 5 to 10 c.c. at a time. He records good results from the treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1929, i, 1070; ²*Amer. Med.* 1929, May, 287.

PSILOSI. (See SPRUE.)

PSITTACOSIS.

Robert Hutchison, M.D., F.R.C.P.

The outbreak of this disease which was referred to in an article in the *MEDICAL ANNUAL* for 1930 (p. 436) has led to a number of publications. Cases have been described in this country by A. P. Thomson,¹ by R. Hutchison, R. A. Rowlands, and S. Levy-Simpson,² by J. S. Warrack,³ by T. Horder and A. E. Gow,⁴ by Mary C. Radford,⁵ by D. Sage Sutherland,⁶ and by A. T. W. Forrester⁷; in America by H. G. Haines,⁸ and by L. W. Gorham, F. G. Calder, and J. D. Vedder⁹; in Austria by O. Weltmann and J. Widowitz¹⁰; and in Germany by G. Elkeles,¹¹ and by H. Embden and G. Adamy¹²; also by Kerschensteiner,¹³ by A. Krumreich,¹⁴ and by M. Löns and C. Kruchen.¹⁵ References are given by E. Sacquépée and L. Ferrabouc¹⁶ to cases published in France.

SIGNS AND SYMPTOMS.—The clinical details of all these cases do not add anything material to the general description of psittacosis given in last year's *ANNUAL*. After an incubation period of from seven to ten days the disease sets in like a case of typhoid, only rather more abruptly. Enlargement of the spleen and rose spots are usually absent. After about a week pulmonary signs supervene, rather insidiously as a rule, and may go on to complete consolidation of a large part of a lung, but there is a singular absence of cough, respiratory distress, or expectoration. Defervescence in a favourable case takes place at the end of two or three weeks, but even after the temperature has fallen there

may be an increase in the toxæmia, and sometimes the patient falls into an apathetic condition for a time almost suggesting Parkinsonism.

DIAGNOSIS.—A deceptive feature in the diagnosis from typhoid is that the agglutination reaction to the *B. typhosus* is sometimes positive. Indeed, a positive agglutination to one strain of typhoid organism occurring early in the disease and in a high degree of dilution is rather suggestive of psittacosis than otherwise. The blood cultures, however, are negative.

It may be impossible at the outset to distinguish psittacosis from influenza, but the supervention of pulmonary complications within the first few days is in favour of the latter. When all is said and done, however, the diagnosis depends mainly upon the previous association of the patient with a sick parrot or love-bird.

EPIDEMIOLOGY.—It is now known that the epidemic of 1929-30 originated in the Argentine, where a large number of cases occurred in the town of Cordoba in Central Argentina in the summer of 1929, the disease being conveyed from that country to Europe by infected birds.¹⁷ The disease is highly contagious from the bird to man, but man-to-man infection is very rare, though it undoubtedly occurs. There have been several outbreaks of psittacosis amongst laboratory workers engaged in its investigation, notably one in Washington,¹⁸ and in view of the precautions taken the mode of infection in such cases is obscure. As there have been no fresh cases of the disease reported in recent months, the outbreak may now be regarded as at an end, and no doubt the prohibition of the importation of parrots which has been adopted by most European countries has contributed to bring this about.

ETIOLOGY.—As a result of the investigations carried out by S. P. Bedson, G. T. Western, and S. Levy-Simpson¹⁹ at the London Hospital, it seems now to be definitely established that psittacosis is due to infection by a filtrable virus. M. H. Gordon²⁰ has confirmed their results, and has found that the strains of virus obtained from the parrots associated with one case increased their virulence by passage through mice. He suggests that it may belong to the same group as the herpes virus. Karl Pesch²¹ in Germany and E. Saquépéc and L. Ferrabouc²² in France are also convinced, as a result of their independent investigations, that a filtrable virus is the cause of the disease. A. C. Coles²³ has examined dry blood-films from some of the London Hospital cases, and has found coccoid bodies small enough to pass a Seitz filter, which he believes may be the causal organisms. He provisionally terms them 'the coccoid X bodies of psittacosis'. He also found a few small bacilli which are probably secondary invaders.

PATHOLOGY.—The post-mortem appearances were those of a severe septiciæmia, with well-marked changes in the lungs. The latter did not present the picture of classical lobar pneumonia or bronchopneumonia, but were characteristic of psittacosis. Turnbull² describes the condition as "a peculiar hæmorrhagic vesicular pneumonia, complicated by pulmonary thrombosis and free from bacteria". In addition, areas of mucopurulent bronchitis and bronchopneumonia might occur owing to secondary infection. The main lesion consisted of large areas of pneumonic consolidation, not confined to any one lobe, and sometimes formed by the confluence of similar smaller areas. The bronchioles in the characteristic areas were never the foci of the inflammation, although naturally involved with the rest of the lung substance. He summarizes the microscopic findings thus: "Briefly, an intense engorgement, proliferation, and desquamation of epithelium, leucocytic infiltration and slight hæmorrhage, were followed by increasing hæmorrhage, abundant serous and later fibrinous exudate, progressive degeneration and death of the earlier infiltrating cells, and an increasing thrombosis of capillaries and small and

large pulmonary arteries." The pleuræ were often covered by patches of fibrin, but effusion of any magnitude was rare. Congestion and œdema of the brain and spinal cord were not infrequent, and ring-hæmorrhages sometimes occurred. The gastro-intestinal tract was remarkably free from any severe inflammation, the intestinal lymphoid follicles not being especially involved. The spleen was diffident red and septic, with destruction of the normal pattern. The kidneys and liver showed parenchymatous degeneration. Hæmorrhages into the rectus abdominis muscles occurred. There was a remarkable constancy in the essential pathological changes noted by different observers, although secondary infection might give the appearance of bronchopneumonia, sometimes resembling that of influenza epidemics. (Wilson,¹ Turnbull,² Kettle,⁴ Oberndorfer,¹³ Krumeich,¹⁴ H. Siegmund.²⁴)

PROGNOSIS.—Of 117 cases in this country 25 were fatal (21·4 per cent). The severity of the pulmonary lesions and the failure to maintain a relatively slow pulse were the important factors in determining a serious prognosis. Children and young adults usually recovered.²⁵

TREATMENT.—There is nothing new to report as regards the treatment of psittacosis; cases can only be managed on the same general lines as typhoid fever and pneumonia. The use of convalescent serum has proved disappointing.

REFERENCES.—¹*Lancet*, 1929, ii, 115; ²*Brit. Med. Jour.* 1930, i, 633; ³*Ibid.* 111; ⁴*Lancet*, 1930, i, 442; ⁵*Brit. Med. Jour.* 1930, i, 333; ⁶*Lancet*, 1930, i, 1306; ⁷*Ibid.* 323; ⁸*Jour. Amer. Med. Assoc.* 1930, June 7, 1821; ⁹*Ibid.* 1816; ¹⁰*Wien. klin. Woch.* 1930, Feb. 13, 193; ¹¹*Munch. med. Woch.* 1930, Jan. 24, 139; ¹²*Ibid.* 140; ¹³*Ibid.* Feb. 21, 310; ¹⁴*Ibid.* March 7, 401; ¹⁵*Ibid.* Feb. 28, 358; ¹⁶*Presse méd.* 1930, April 26, 569; ¹⁷*Lancet*, 1930, i, 472; ¹⁸*Ibid.* ii, 535; ¹⁹*Ibid.* i, 235, 345; ²⁰*Ibid.* 1174; ²¹*Munch. med. Woch.* 1930, March 21, 484; ²²*Presse méd.* 1930, April 26, 569; ²³*Lancet*, 1930, i, 1011; ²⁴*Munch. med. Woch.* 1930, Feb. 7, 223; ²⁵*Ministry of Health Report*, 1930, No. 61, 108.

PSYCHOSES. (See MENTAL DEPRESSION, TYPES OF; MENTAL DISEASES; MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

PUERPERIUM, DISORDERS OF. (See also DIATHERMY.)

Beckwith Whitehouse, M.S., F.R.C.S.

Puerperal Mortality.—In view of the world interest in puerperal mortality, and the high figure that still pertains in most European countries to-day, it is important to note that during the ten years 1918–28 the mortality amongst parturient women in Norway reached only 0·7 per cent. This figure is based upon 24,155 women who were delivered in the public maternity hospitals. Of those delivered in the clinics, only from 0·5 to 0·6 per cent died. L. S. Petersen¹ has recently investigated the causes of death during the puerperium in Norway, and he finds that 50 per cent of the existing mortality is accounted for by infection and toxæmia. Toxæmia is actually responsible in Norway for slightly more deaths than infection—a very interesting statement when compared with the state of affairs as indicated by statistics in Great Britain. Ten per cent of the Scandinavian deaths were due to placenta prævia, but as many of the deaths in both toxæmia and placenta prævia are actually caused by infection, Petersen observes that it is more correct to say that probably infection accounts for about two-thirds of the total deaths. In the absence of the primary disease, however, infection would not have occurred. In the author's long series of cases only 5 deaths were caused by rupture of the uterus and 4 by post-partum hæmorrhage. The total mortality includes death from causes not directly associated with pregnancy or labour—for example, influenza and pneumonia, which were very frequent during the years 1918–20. The actual mortality from obstetric complications is therefore very low and affords a striking testimony to the organization and

practice of midwifery in Norway, and perhaps to the healthy physique and lives of the Scandinavian women.

Puerperal Scarlet Fever.—The relationship, clinical and pathological, which scarlet fever bears, if any, to certain cases of puerperal streptococcal infection has long been of importance to the obstetrician. The clinical details associated with two small recent epidemics of scarlet fever at the Lariboisière Hospital, Paris, are therefore of interest. Six cases occurred at this hospital, all in primiparae, during an interval of two months. In one instance infection followed an abortion. The remaining women were at term. In the first case no recent contact could be established, the symptoms appearing on the third day of the puerperium. No recent febrile illness could be traced in the patient's family or amongst her associates. The second case occurred on the tenth day after delivery in a woman occupying a ward communicating with the ward where the first case occurred. A physician called in consultation to the first case himself developed typical scarlet fever!

The second epidemic consisted of four cases. The first patient, a girl of 17, developed symptoms on the fourth day of her puerperium, having been admitted to the labour ward three days before her confinement. Here again no previous contact with a febrile case could be established. The second woman to develop symptoms had occupied the same ward with the preceding patient for twenty-four hours! The third case was also an obvious contact, having entered the post-delivery ward whilst one of the other patients still occupied it. In her case scarlet fever developed on the seventh day of the puerperium. The post-abortion case showed signs of infection on the third day after abortion and was complicated by otitis.

L. Devraigne, L. Baize, and M. Mayer,² who report the epidemics, note that the contagiousness appears to have been slight, since the wards were crowded at the time, and persons at a distance contracted the disease—not those in close contact. In each case a very definite infection of the genital tract was present, and none of the women had the type of pharyngitis usually present at the onset of scarlet fever. The genital tract therefore appeared to be the portal of entrance. The physician, however, who contracted the infection developed a characteristic sore throat.

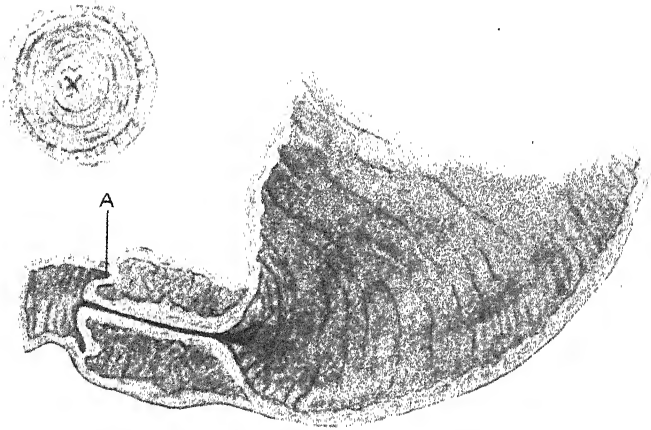
Discussing the differential diagnosis between scarlet fever of puerperal origin and a streptococcal puerperal erythema, the authors lay stress upon vomiting and a very rapid pulse-rate in the former. Streptococcal erythemas usually appear only in cases of severe generalized puerperal infection with all the signs of a grave septicæmia. In all the Lariboisière cases the actual puerperal infection was very discrete. None of the infants contracted scarlet fever.

In this report an obvious criticism is that no reference is made to the bacteriological investigation of the genital tract. The occurrence from time to time in parturient women of cases typical of scarlet fever and of others showing scarlatiniform erythema with streptococcal septicæmia appears to point to local infection of the genital tract with different strains of the same hæmolytic streptococcus. The favourable results attending treatment with **Anti-Scarlet-Fever Serum** in the majority of cases of streptococcal infection of the parturient canal without clinical erythema afford further confirmation of this. A few years ago a very striking instance of the relationship of puerperal streptococcal infection to scarlet fever came under the reviewer's notice. A hunting man developed a very acute streptococcal pharyngitis which responded to local treatment. His two daughters on returning home from school three months later both developed typical scarlet fever and were notified as such. Both girls recovered, and the house was completely sterilized so far as human intelligence could effect this. The wife had meanwhile

PLATE XLVI

CONGENITAL STENOSIS OF PYLORUS

(ALFRED BROWN)



Longitudinal and cross-section of congenital hypertrophic pylorus (*after Richter*). Note projection of the apex of the tumour into the duodenum. Incision at A will open the lumen of the gut.

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become pregnant. She was confined eight months later, and twenty-four hours after natural delivery at her own home she showed evidence of profound infection accompanied by a typical scarlet fever erythema. Both the lochia and the blood contained a short-chain hæmolytic streptococcus, and the woman died forty-eight hours after delivery.

REFERENCES.—¹*Acta obst. et gynecol. Scand.* 1930, ix, 432; ²*Bull. Soc. d'Obst. et Gynéc.* 1929, xviii, 337.

PULMONARY AFFECTIONS. (*See* ASBESTOSIS, PULMONARY; ASTHMA; INDUSTRIAL DISEASES; LUNG, ABSCESS OF; LUNG, APUTRID NECROSIS OF; LUNG, MASSIVE COLLAPSE OF; LUNG AND MEDIASTINUM, TUMOURS OF; PRE- AND POST-OPERATIVE TREATMENT; TUBERCULOSIS, PULMONARY; X-RAY DIAGNOSIS.)

PYELOGRAPHY. (*See* KIDNEY, SURGICAL AFFECTIONS OF; X-RAY DIAGNOSIS.)

PYLORUS, CONGENITAL STENOSIS OF.

John Fraser, Ch.M., F.R.C.S.Ed.

Does the tumour-like tissue thickening of a congenital pyloric stenosis tend to disappear spontaneously? The answer is that in certain cases it undoubtedly does. Professor B. Heile¹ suggests that the explanation of the variability is a structural one. He describes two types of tumour—the one pale and hard and avascular, the other soft and moderately well supplied with blood-vessels. Heile believes that the second type undergoes spontaneous disappearance, but that the former is likely to persist for an indefinite time. He states that autopsies have confirmed this observation.

The hard type of tumour formation is the commoner, and it is pointed out that if a child affected with a tumour of this type is treated by pure conservatism, though vomiting may cease and an apparent cure result, there is a retention of stomach contents over a period of four hours and longer. The author has shown that even when a Rammstedt operation is performed an abnormal degree of gastric retention persists, and he suggests a modification of the present procedure. An anterior pyloric incision is used, but the edges of the incision are excised in a V-shaped manner, the posterior surface of the pyloric canal is exposed and its muscular wall incised longitudinally down to the mucous coat; by this means it is claimed that all tendency to undue gastric retention is avoided.

The permanency of the pyloric tumour formation is referred to by Alfred Brown.² He quotes certain references in support of his contention—Wullstein's observations that the operation of gastro-enterostomy has no effect on the tumour; Oliver's case of a congenital stenosis persisting to the age of 51 years, and a similar record by Starlaver in a man of 21 years. Brown has little faith in medical treatment; he prefers to regard the condition as a high intestinal obstruction demanding emergency measures, and therefore he operates as early as possible—within twelve or eighteen hours of a definite diagnosis being arrived at, and after a preparatory treatment which embraces gastric lavage, proctoclysis, and the intraperitoneal injection of salt solution. The operative treatment is on the Rammstedt plan; but Brown points out that, if we are to incise the pyloric wall in a really avascular area, we should choose the upper posterior portion (Dyer). The paper contains an interesting anatomical explanation of the liability which there is to injure the duodenum during the course of the operation (*Plate XLVI*).

The record of a case of congenital hypertrophic pyloric stenosis in a man

of 72 by F. D. Ackman³ is in some respects confirmatory of the papers quoted above. Ackman's paper contains a summary of the literature dealing with the persistence of congenital pyloric stenosis into later life, and it also includes an account of the pathology associated with the condition. There seems to be little doubt that this error is of more frequent occurrence than has hitherto been supposed.

REFERENCES.—¹*Zentralb. f. Chir.* 1930, Jan. 4, 19; ²*Ann. of Surg.* 1929, Oct., 507; ³*Canad. Med. Assoc. Jour.* 1929, Oct., 423.

PYOGENIC INFECTIONS. (See also SKIN, PYOGENIC INFECTIONS OF; STAPHYLOCOCCAL INFECTIONS.) *Ivor J. Davies, M.D.*

Septicæmia.—A. B. Rosher¹ (London) writes on the treatment of streptococcal septicæmia with streptococcal **Vaccine**, with a record of four severe cases which were successfully treated in this manner. Scarlet fever streptococcus antitoxin was used. The best method of injection and the most desirable quantity of serum have yet to be determined. In Sanderson's cases and in the said four cases (with one exception) the injections were given subcutaneously or intramuscularly, and never more than 20 c.c. at a time were administered. On the other hand, H. Burt-White,² for reasons unstated, has abandoned the intramuscular method and never gives less than 20 c.c. intravenously, and in some cases as much as 100 c.c. at a time. Of course, the mode of procedure in this respect must largely be regulated by the condition of the patient, but it seems reasonable to aim at giving not more than is necessary to produce the maximum effect—more especially when the intravenous route is employed, for L. A. Tooney³ has shown that this method is not without risk.

D. S. Adams⁴ (Worcester, Mass.) reports twelve cases of septicæmia, and concludes: (1) Mercurochrome and fresh blood apparently have no effect on hæmolytic organisms. (2) Late cases offer no hope as regards treatment, particularly those cases with face involvement. (3) Where the blood-stream is involved, amputation of an extremity rarely offers more than incision and drainage; shock is thereby added to sepsis. (4) Antistreptococci serum, either anti-erysipelas or antiscarlatinal (preferably the latter), is worth using except in cases *in extremis*. It should be used together with incision and drainage and is most valuable by vein.

'**Staphylococcal Fever.**'—J. A. Ryle⁵ (London) contributes a useful practical article on staphylococcal infections, entitled "The Natural History, Prognosis and Treatment of Staphylococcal Fever". He urges a comprehensive view of disease, and refers to Gull, who decried 'a narrow pathology' and who was insistent on the value of what he called 'the general view'. Staphylococcal infections of the skin are complicated from time to time by a blood-stream invasion. This may take a benign form (bactæmia) and produce a single 'fixation' metastasis, or several small abscesses without real danger to life. Alternatively there may result a severe form (septicæmia or pyæmia) with prolonged fever, rigors, sweats, multiple metastases, and positive blood-cultures. The favourite site of localization in adult life is the renal cortex, usually with secondary perinephritis or perinephric abscess. Other tissues frequently involved are the lungs, the skin, the muscles, and the prostate gland. Brain abscess is a rare and grave complication. Pulmonary tuberculosis, spinal or hip disease, and typhoid fever may be simulated. In every case of obscure continued fever a careful inquiry should be made in regard to recent carbuncle or furunculosis. With youth and a good leucocytosis the prognosis in staphylococcal septicæmia is by no means bad. With watchful care, good nursing, a copious fluid intake, surgical treatment of abscesses which can be

readily approached, and sunshine and fresh air in early convalescence there is a good prospect of complete recovery. The early appearance of a natural fixation abscess is always a favourable feature. Vaccine therapy and chemotherapy are probably better avoided. They are not altogether without risk; there is no conclusive evidence that they do good; the severest cases can recover without them; their employment may give a false sense of security and distract attention from rational medical and surgical procedures which are vitally important.

Antivirus Therapy.—Professor A. Besredka⁶ (Paris) has claimed that remarkable results are obtained in almost every type of infection by the application of antivirus therapy. The term 'antivirus' is given to substances of microbic origin capable of local vaccination without the introduction of antibodies. Antiviruses, like the microbes from which they are derived, are selective in their action. They affect only a certain group of cells, known as 'receptives'. For instance the staphylococcus vaccine has a selective affinity for the cells of the skin and of certain mucous membranes, the cholera antivirus is taken up by the lining membrane of the intestine, and so on. He stated that a large number of publications during the last ten years show that vaccine treatment by mouth employed as a preventive of dysentery has notably reduced both the morbidity and the mortality of the disease; the same is true of the treatment employed for curative purposes. Vaccination against typhoid fever by vaccine administered by mouth, formerly regarded with great suspicion, is now taking its place in ordinary practice. Various epidemiologists state that this method of treatment, used as a preventive, is quite as effective as subcutaneous inoculation.

Good results have also been obtained in France and Germany in most of the ordinary infections. Professor Besredka stated that clinical observations published on the local vaccine treatment of furunculosis and of carbuncles are already numbered by hundreds. Most clinicians now prefer local dressings to intracutaneous injections; the dressings being soaked with filtered cultures in bouillon or with a mixture of lanolin and vaseline in which the antivirus is incorporated. This method is now part of everyday practice. The same may be said of erysipelas. The streptococcus antivirus employed in these cases is in the form either of a liquid or of a cream. The dressings should be much larger than the infected region, so as to cover a considerable area of healthy skin; they should be left in place for twenty-four hours.

Up to the present the ocular affections in man which have been clinically shown to derive the greatest benefit from vaccine treatment are blepharitis, dacryocystitis, conjunctivitis, ulceration of the cornea, and keratitis. In blepharitis, during the few days immediately following administration of the specially prepared dressing—often on the following day—the glands are found to have emptied their contents on to the pads. Local vaccine therapy has also been successfully employed in furunculosis and other affections of the ear, sinusitis, pyorrhœa alveolaris and other buccal affections. In the subsequent discussion at the meeting of the particular section at the Royal Society of Medicine, opposition of some weight was offered to Professor Besredka's views. The method of treatment is novel, and this authoritative contribution should be studied in detail.

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PYOPNEUMOPERICARDIUM. (See HEART AND PERICARDIUM, SURGERY OF; X-RAY DIAGNOSIS.)

PYORRHEA ALVEOLARIS. (*See* DENTAL CARIES AND PYORRHEA ALVEOLARIS.)

PYURIA. (*See* PHARMACOLOGY AND GENERAL THERAPEUTICS.)

QUINSY. (*See* PHARYNX, DISEASES OF.)

RADIOTHERAPY. (*See also* BREAST, TUMOURS OF; EYE AFFECTIONS; PITUITARY TUMOURS; RECTUM, CANCER OF; X-RAY THERAPY.)

RADIUM IN GYNÆCOLOGY. *Beckwith Whitehouse, M.S., F.R.C.S.*

The position of radium in the treatment of various gynaecological conditions is considered by Malcolm Donaldson¹ in an opening paper to a discussion at the Royal Society of Medicine on Feb. 21, 1930.

Carcinoma of the Cervix.—The position with regard to carcinoma of the cervix uteri is now well known. Several techniques have been evolved and are in use in different centres, but the chief amongst these are the Heyman or Stockholm method, the Paris technique, the Brussels technique, and the St. Bartholomew's Hospital technique.

The Heyman method is a surface application to the growth of about 120 mgrm. of radium element on three occasions at weekly or fortnightly intervals, the duration of each being about twenty-four hours. The Paris method is also a surface application, but the dose of radium is only 66 mgrm. and applied, suitably filtered, for five or six days. The Brussels technique involves only 40 to 50 mgrm. radium applied for a longer period, even up to fifteen days. At St. Bartholomew's, Donaldson's technique consists of 50 mgrm. of radium in the form of needles, which are buried in the growth for six days, the object being to distribute the radium more evenly around the tumour by means of multiple foci.

The Radiological Sub-Committee of the League of Nations found it impossible to compare the results of these various methods inasmuch as data were not available to show the advance of the disease in the comparable groups. Apparently, however, all methods in use are efficient in destroying the growth in the cervix and vagina. The difficulty is to destroy the growing edge of the neoplasm and the metastases in the iliac glands. This is the problem which to-day is exercising the minds of gynaecological surgeons and radiologists, and various methods are being tried out. In Stockholm, Paris, and London the combination of local technique with irradiation at a distance by means of a radium bomb or X rays is being investigated. At St. Bartholomew's Hospital, London, and at the General Hospital, Birmingham, radium is being directly implanted into the peritoneal cavity in direct relationship with the uterine parametria and the iliac glands. Donaldson's technique is to implant about twenty 2-mgrm. needles in the pelvic tissues surrounding the growth, through a laparotomy incision. The abdomen is re-opened at the end of a week and the needles are removed. At the General Hospital, Birmingham, the needles (1-mgrm.) are placed in line, enclosed in rubber tubing. As a rule four tubes are employed, and these are sutured by means of fine catgut to the peritoneum of the broad ligaments or over the iliac glands. The tubes are brought out at the lower end of the abdominal incision and remain *in situ* for about a week. At the end of this time the catgut has absorbed and the tubes are removed without any great difficulty.

Carcinoma of the Vagina.—Donaldson observes that a few needles of small intensity placed around and in the growth and left in position for six days will cause complete disappearance of vaginal epithelioma.

Carcinoma of the Vulva.—For growths of the vulva the writer advocates the

use of a small amount of radium over a long period. Donaldson has treated a few cases with success by means of small-intensity needles, never greater than 0.6 mgrm. and never nearer to each other than 1.5 cm. They are left in position for from ten to twenty-one days.

At the Radiumhemmet, Stockholm, vulval epithelioma is to-day always treated by means of **Diathermy**. Bervin considers that the results obtained by this means are better than those given by radium.

Chorionepithelioma.—Donaldson has treated one case of chorionepithelioma with a secondary metastasis in the vagina by means of combined X rays and radium. The patient was first treated by X rays, and radium was then placed in utero and around the vaginal deposit. She was alive and well one year after treatment.

Carcinoma of the Uterine Body.—The general opinion is still that these cases are best treated by total **Hysterectomy**. The results are so satisfactory by this method that with our present knowledge of radium it seems better to regard carcinoma in this situation as an indication for surgery rather than radiotherapy. The latter should be reserved for cases where for various reasons operation is contra-indicated.

Benign Conditions treated by Radium.—Amongst non-malignant conditions now regarded as suitable for treatment with radium are included certain fibroids, menopausal hæmorrhage, and also severe irregular uterine bleeding in women under 40 without any obvious physical signs. The latter group includes that rather ill-defined type of case variously classed under the terms 'chronic metritis', 'chronic subinvolution', 'adenomatosis' or 'adenoma of the endometrium', or simply 'endometrial hyperplasia'.

To control severe *menopausal hæmorrhage*, an intra-uterine dose of 50 mgrm. of radium element enclosed in a single tube with a filter of 0.5 mm. of platinum, left *in situ* for seventy-two hours, is usually sufficient to control the bleeding and produce the artificial menopause. Of 122 patients treated on these lines at St. Bartholomew's, only 9 required further treatment to produce amenorrhœa. These figures coincide with the results of other observers.

When radium is used to control *severe bleeding* in women under the age of 40 it is by no means unusual for patients to menstruate again after a varying period of amenorrhœa, and for the periods then to become normal. In two cases known to the reviewer, pregnancy occurred after control of severe uterine hæmorrhage by means of radium and the periods were normally re-established after a period of amenorrhœa.

The cases of *fibromyoma* suitable for radiotherapy are those in women at or over the age of 40 in whom the tumour is not larger than a full-time foetal head and the symptoms are those of hæmorrhage and not pressure or degeneration of the neoplasm. Larger growths should not be treated by radium owing to the possible coexistence of degenerative changes or inflammatory lesions in the uterine appendages. Whenever irregular hæmorrhage is present as distinct from a true menorrhagia, the cavity of the uterus should be carefully explored before radium treatment to exclude malignant disease.

Donaldson concludes a very interesting review of the present status of radium in gynæcology by issuing an appeal to all those using radiotherapy not to regard it purely as a mechanical method of destroying growth and so forth, but to look upon it as a science needing a team of physicists, chemists, biologists, pathologists, radiologists, and clinicians, in order to solve the various problems and to secure the best results—a view which will be cordially endorsed by all those working in the Radium Centres, now being established in Great Britain.

REFERENCE.—¹*Proc. Roy. Soc. Med.* 1930, May, 1065.

RADIUM TREATMENT OF CANCER.*Stanford Cude, F.R.C.S.*

The progress in radium therapy since the publication of the last MEDICAL ANNUAL has been more in the field of education and distribution of radium to various centres than in any actual advance in the treatment of malignant disease by radiation. The present stage of radiation in the treatment of cancer was the subject of discussion at the British Medical Association Meeting in Winnipeg. The treatment of cancer of the uterus, buccal cavity, rectum, and bladder was discussed. The methods at present applied vary in detail from centre to centre; the principle, however, is the same, based upon uniform irradiation of the cancer-bearing area by means of screened radium, so that gamma irradiation only is used, prolonged over periods of about seven to ten days for interstitial irradiation, and two or three weeks for surface treatment. (*Plates XLVII, XLVIII.*)

The treatment of carcinoma of the *cervix uteri* is now fairly standardized; the technique is based upon the principles advocated by Heyman, of Stockholm—namely, the 'split dose' or repeated treatment at brief intervals. There is, however, no unanimity as regards actual dosage or the screenage employed. The treatment of the pelvic glandular area is still a matter of experiment, varying from total neglect of any treatment to X-ray therapy or intra-abdominal needling. In the *buccal cavity* the advances made in the past year are chiefly in the method of attack of the glandular area in the neck. Surface application by means of 'collars' and blind needling without surgery of access are supplemented by more accurate radiation by open operation, so as to permit distribution of radiation evenly over the whole lymphatic area. In cancer of the *breast*, the results of surgical treatment in early cases are sufficiently good to make the majority of surgeons hesitate before advocating radium treatment in operable cases. Radium therapy in this situation has not yet been practised long enough for end-results in this group to be compared with those of surgery; in borderline cases and in inoperable cases it is the method of choice, and gives better results than X-ray treatment.

For carcinoma of the *rectum* surgical excision in operable cases holds the first place, and radium is only a 'subsidiary method'.

Calculation of Dosage.—No advance has been made in the study of the effect of irradiation on the tissues or on the cells; the nature of the action of radium is still not understood. Calculation of dosage in most centres is still done in milligramme-hours, and no method has been evolved to replace this means of notation. Professor Stahel, physicist to the Brussels centre, put forward a method of calculation in which the doses applied to the skin are expressed in units of energy absorbed by each cubic centimetre of tissue. The unit adopted is the erg, and the energy absorbed is expressed in 'erg centimetre cube milligramme hours'. Failla and Quimby, of the Memorial Hospital in New York, calculate the dose in units of 'erythema'. Neither of these methods is yet universally accepted. They represent, however, an attempt to express the dosage in radium therapy by a unit based on biological effects. Further researches in the action of radiation on the tissues will probably provide an unusual unit of dosage.

Teletherapy, or treatment by the so-called 'bomb' containing several grammes of radium, has not yet achieved the results anticipated on theoretical grounds from massive irradiation. The quantities of radium employed have up till now not exceeded 4 grm., the radium-skin distance varying from 8 to 10 cm.; the depth dose obtained has not been sufficient to permit teletherapy to become the sole method of irradiation even in centres where 'bombs' are available. In New York and Paris it is used chiefly as a supplementary method to interstitial or cavitary application.

PLATE XLVII

RADIUM TREATMENT OF CANCER
(STAMFORD CADE)



Fig. C.—Sorbo-rubber skull-cap, showing radium needles in position, as used for surface irradiation of cerebral tumours.



Fig. D.—Columbia paste jacket, with radium needles in position, as used for surface irradiation in the second stage of treatment of cancer of the breast.

PLATE XLVIII

RADIUM TREATMENT OF CANCER—*continued*
(STANTFORD (ADE))



Fig. J.—Case of cancer of the nose before radium treatment.



Fig. R.—Five months after treatment.

Public opinion as regards radium has passed from a state of exaggerated enthusiasm to that of cautious pessimism. Neither is justifiable. Radium holds a unique position in the treatment of cancer if the impossible is not expected. Early cases in accessible situations give good results in a large number of cases, but radium *per se* remains a local remedy and is no weapon for the treatment of dissemination. Of local conditions, radiosensitivity differs with site of the disease and nature of the cells. Squamous-celled carcinoma is a favourable type in most situations, but there are well-known exceptions, such as the œsophagus. Radium therapy is essentially a speciality to be practised with the help of clinicians and laboratory workers; it offers many pitfalls and many disappointments, but this in no way detracts from its value as a cancer-destroying agent. In some situations it has displaced surgery; in others it equals in its results those achieved by excision; in all the mutilation of surgical treatment is either completely abolished or greatly diminished. In skilful hands the irradiation risks are very small. Attempts at the production of immunization by radium have failed so far, and it is unlikely that this will be achieved till the action of radium is understood.

Harmful Effects of Irradiation.—The most valuable contribution to the literature on radium during the past year is that of Sir Humphry Rolleston, who reviewed all the data available in the literature on the harmful effects of radium and X rays. D. Walsh was the first to direct attention to severe constitutional symptoms in X-ray workers, in one of whom the symptoms disappeared after the protection of the abdomen by lead.

Stimulating Effect of Irradiation.—A review of the work on the possible stimulating effect of irradiation on the tissues shows that any apparent stimulation is a temporary phase and is invariably followed by functional and organic deterioration. As regards the malignant cells, it has often been stated that irradiation may be followed by an increase in the size of metastasis. Local stimulating effects have been described by various authors, presumed to be due to the irritation by small doses at the periphery of the lesion, the farthest away from the source of irradiation. An instance of such proliferative effect was described by one observer who noticed secondary nodules of carcinoma in the skin at the site of implantation of radium needles. The reactions of malignant tumours to irradiation show three phases: (1) Diminished growth (arrest of mitosis); (2) Abnormal growth (atypical mitosis); (3) Arrest of growth (amitosis). The change in the volume of the growth after radiation may be due to vascular changes, congestion, or absorption of fluid. Increased activity and generalization of neoplasms after irradiation can be explained on grounds other than direct stimulation, thus by the effect on the surrounding tissues and impairment of general resistance. There is at present no definite evidence of a stimulating action of radiation on malignant growths.

Acute Constitutional Symptoms.—Acute constitutional symptoms are more frequently seen after X- than after gamma-irradiation. In radium therapy they are much more obvious in surface and distance therapy with large quantities of radium than in interstitial radiation. Mild symptoms—malaise, headache, nausea, and diarrhœa—are a temporary manifestation. They can be produced experimentally by intravenous injection of radium in dogs. It is possible that cellular destruction and the consequent effect of protein absorption is the cause of these manifestations. It is known that irradiation of the upper abdomen causes much more severe constitutional disturbance than irradiation of the head and neck or of the pelvis. Patients already in a toxic condition are more prone to 'radium sickness'. The symptoms may be due to the effect of irradiation on the intestine, the liver, spleen, or lymphatic glands. Prolonged exposure to radium destroys enulsin, trypsin, pepsin, and

ptyalin; tyrosinase, however, is not affected, and this suggests that oxydases are not influenced by radium (Henri and Mayer). Burghheim examined seventy-eight irradiated patients and found a constant fall in the cholesterol content.

As to the mechanism by which tissue disintegration brings about irradiation sickness the opinion varies. Lange suggests that local or general acidosis is the cause, and this view is supported by Dodds and others. Hussey's observations, partly on chemical and partly on clinical grounds, suggest alkalosis as the cause of the symptoms. The contradiction of these views suggests the occurrence of diverse metabolic changes at different stages of irradiation. Another hypothesis is that anaphylaxis is the cause of the constitutional disturbance following irradiation, but as this occurs after the first irradiation, it is difficult to accept this explanation.

Effects of Irradiation on the Blood.—Among radium workers Gudzent and Halberstaedter found a relative and absolute lymphocytosis of about 46 per cent, a diminution of polymorphonuclears to 50 per cent, and a slight fall in the total white-count. Mottram found a diminution in both polymorphonuclears and lymphocytes, also a low red-count. Cramer, Drew, and Mottram pointed out that experimentally thrombopenia is caused by penetrating gamma rays. Leucopenia is ascribed by some workers to the direct action on the leucocytes; Lacassagne, however, believes that it is due to the arrest of leucocyte formation in the damaged leucocyte-forming tissues. The phagocytic power is stated to be diminished by irradiation. Gamma irradiation appears to have a much greater tendency to cause aplastic anæmia than X-radiation. This forms an industrial risk in workers with radium, as exemplified by 20 cases, 15 fatal, of aplastic anæmia among girls employed in painting luminous dials with small quantities of radium and mesothorium. The radio-active substance remains permanently in the body and was found in one case five years after death. Radio-active particles collect in the bones and in the bone-marrow.

Local Lesions.—The local changes in those handling radium are chiefly due to alpha and beta particles. The clinical manifestations are blunting of sensibility of the finger-tips, paræsthesia and anæsthesia. Physical changes include flattening of the ridges of the skin, with resulting alteration of the fingerprints and thickness of the epidermis and chronic dermatitis. If the injury is sufficiently severe, repair is impossible; hair follicles, sebaceous and sweat glands disappear entirely. Telangiectasis and pigmentary changes develop and chronic ulceration takes place. Squamous-celled carcinoma following radium application has been reported, but is exceedingly rare as compared with neoplasms following X-ray dermatitis.

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RECTUM, CANCER OF.

J. P. Lockhart-Mummery, F.R.C.S.

Method of Spread.—It is obvious that the manner in which a malignant growth spreads into the surrounding tissues and into the lymphatics is of the utmost importance to surgeons and has a very great bearing upon the method of treatment adopted to eradicate the growth. A very important paper on this subject was published by C. Dukes.¹ He draws the following conclusions: (1) In three-quarters of the cases of cancer of the rectum accepted by surgeons as operable, the cancer has already spread by direct continuity into the perirectal tissues. (2) In more than half of these cases the anorectal or retrorectal lymphatic glands contain metastases. This means that in about

PLATE XLIX

CARCINOMA OF THE RECTUM (C. DUKES)

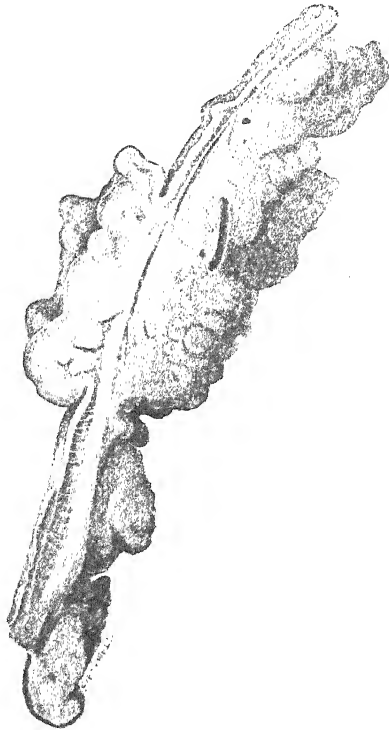


Fig. A.—Longitudinal slice of the wall of the rectum to show the general shape of a cancer which has spread only as far as the submucosa.

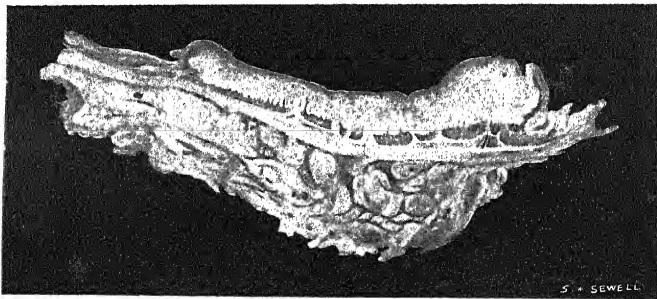


Fig. B.—Longitudinal slice of the wall of the rectum, showing the manner in which a malignant growth invades the muscle coat by means of roots which push their way between the segments of the circular muscle.

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one-third of all cases considered operable the lymphatic glands are involved. (3) Cancer of the rectum commences in the mucous membrane and extends slowly by direct extension on the surface and infiltration of the rectal wall. As a rule lymphatic dissemination does not play any part in the spread of cancer of the rectum until the growth has spread by direct continuity into the perirectal tissues. (4) It is not possible until the growth has been removed and examined microscopically to tell for certain whether it has spread into the perirectal tissues, but as a rough rule it may be said that pedunculated growths projecting into the bowel are more generally localized to the mucous membrane; whereas growths where there is an excavated ulcer have more frequently spread into the perirectal tissues. (*Plate XLIX.*)

Operative Treatment.—During the last year several surgeons have published papers on long series of cases of cancer of the rectum treated by radical operation. D. F. Jones² gives a series of 268 cases so treated and tabulates the results at the end of five years. The mortality percentage was 22.7 and the cures on a five-year basis 47.8. J. Lynch³ records 335 cases subjected to radical operation, with a mortality of 16 per cent. Recurrence figures, however, are not given. F. Mandl,⁴ of Dr. Hocheneegg's clinic in Vienna, reports 984 cases treated by excision by the sacral route, with an operative mortality of 11.6 per cent. The proportion of traced cases alive on a five-year basis is 30 per cent, although in quite a number of cases recurrence occurred after this period. R. Kuettner⁵ gives the results of 1300 cases of cancer of the rectum. The mortality from operation was 22.5 per cent, but this has been reduced in the last seven years to 17.3 per cent. Most of the operations were by the perineal or sacral routes. Of the patients radically operated upon 32 per cent survived the operation more than five years and no case of recurrence was observed later than ten years.

Radium Treatment.—The treatment of cancer of the rectum by means of radium has not yet reached a stage when it can in any way be compared with the results of operation. No figures have been published which show any high percentage of cures comparable with those from operation, and no surgeon at present would maintain that radium is any substitute for operation in a case that was otherwise operable, radium being reserved for cases of cancer in very aged patients or those with intercurrent disease which contra-indicate radical operation, and cases that are inoperable.

J. P. Lockhart-Mummery⁶ points out that radium may be of value as an adjunct to excision, by allowing the surgeon to do a less radical operation and so in some cases preserve the rectum, the radium being used to prevent recurrence by dealing with the tissues outside the rectum and the lymphatics, which in a radical operation would have been removed. It is possible that radium in course of time may prove very valuable in this connection.

G. E. Binkley⁷ gives results of treatment of rectal cancer by means of radiation at the Memorial Hospital. Of the cases treated previous to 1925, 18 were alive and free from recognizable growth after a period varying from three and a half to eight years. Of the cases treated since 1925 there were 153 where follow-up records had been kept, and out of these, 32 were considered favourable and 121 unfavourable. Of the favourable group, 72 per cent are alive and well and clinically free from cancer, though the period that has elapsed since operation is very short. In the unfavourable cases a lessening or disappearance of symptoms and a marked prolongation of life were observed. He concludes that a combination of radical surgery and radiation often gives the best results.

J. Muir⁸ describes the technique of the treatment of rectal cancer by the implantation of radon seeds. He considers that this method is better than the

use of needles as there is less caustic effect on the immediate tissues. He regards it as important that the entire radiation should be given in a single dose, as when cases are treated by fractional dosage the tissues become radio-resistant. He believes it to be very important that the dose of radium should act over a long period of time, and prefers to use radon seeds with threads so that they can be removed rather than to leave them *in situ*. Very careful placing of the seeds so that all actively malignant cells should be sterilized, but no injury caused to normal tissues, is of great importance, and it depends upon the careful placing of the seeds within and around the malignant tissue.

Sir Charles Gordon-Watson⁹ gives a very careful description of the methods of treating rectal cancer by means of radium needles. He draws attention to the importance of giving a small dose acting over a long period rather than a large dose over a short one, and emphasizes the value of very careful distribution of the needles so that as far as possible a uniform dose of rays will be given to the whole of the malignant tissue and to those parts of the surrounding tissue which may be secondarily involved. He does not consider that radium is any substitute for operation in operable cases, but that it has a very definite utility: (1) In cases that are too advanced for radical surgery; (2) In cases that are suitable for radical operation, but where there are contra-indications on other grounds; (3) Where the patient strongly desires to run the extra risk of being treated by radium rather than by surgery. He prefers to expose the back of the growth by an external excision, barraging the growth with needles inserted systematically so as to give as far as possible 1 mm. of radium to every centimetre of growth. He prefers to use needles containing radium rather than radon seeds, because he thinks the diminishing intensity of the emanation does not give as good results as the continued activity exercised by the radium needles. His experience is based upon 93 cases treated with radium over the last five years and up to the end of 1929. The results are too recent to be able to be assessed with any degree of accuracy. Some are very encouraging, the growth completely disappearing and the patient remaining well up to four years. It is true that the successful cases form a small percentage of the total, but they give encouragement to further perseverance.

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RECTUM, PROLAPSE OF. (See also ANUS AND RECTUM, PROLAPSE OF.)

John Fraser, Ch.M., F.R.C.S.Ed.

This subject is discussed in an article by L. E. C. Horbury.¹

TREATMENT.—The methods of treatment of this troublesome error may be put into two groups, conservatism and operation. The *conservative* treatment implies the elimination of any influence which induces straining, and the prevention of bowel protrusion by the application of cold-water compresses, by enemas, by securing evacuation of the bowel while the child lies on its side or back, and by affording support to the buttocks during defæcation. *Operative* procedure may be divided into three classes: (1) That designed to promote adhesions between the bowel wall and the surrounding parts; (2) The supplying of an artificial support to the anal canal and rectum; and (3) An attempt to restore tone to a stretched and atonic sphincter muscle.

1. The first class includes such procedures as the perirectal and submucous injection of alcohol, quinine, or sulphuric acid, linear cauterization of the mucous membrane, and the separation of the rectum from the hollow of the sacrum, the space being packed with sterile gauze to induce adhesions (Lockhart-Mummery).

2. In the second class we find such methods as the injection of paraffin into the perirectal tissues (Burgess), the subcutaneous perianal insertion of a silver wire (Thiersch), the suturing of the posterior rectal wall to the anterior surface of the sacrococcygeal joint by a transfixing suture (Heald).

3. The third class is the operation of **Sphincteric Pleating**. This is the method advocated by Horbury (Figs. 44-48). After suitable preparation

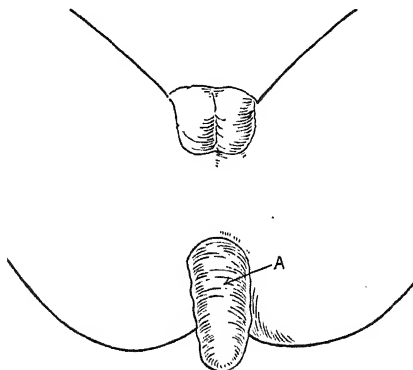


Fig. 44.—The prolapsed rectum (A).

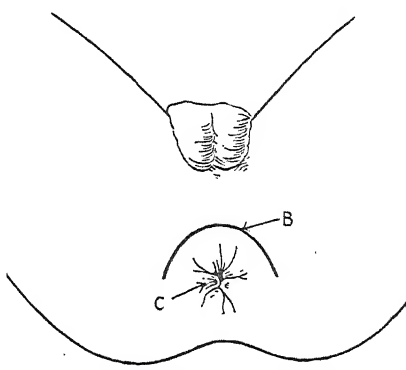


Fig. 45.—Showing the semilunar incision (B).
C, The anus.

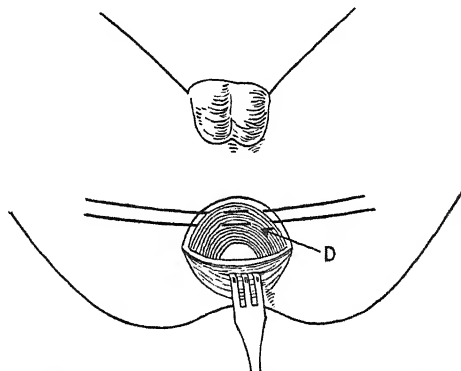


Fig. 46.—The external sphincter exposed, showing the sutures before tying (D).

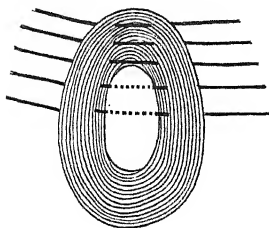


Fig. 47.—The sutures inserted in the muscle.

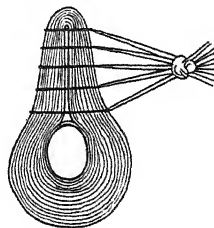


Fig. 48.—The sutures drawn taut.

Figs. 44-48.—HORBURY'S METHOD OF SPHINCTERIC PLEATING FOR PROLAPSE OF THE RECTUM.
(Re-drawn from the 'Practitioner'.)

a semilunar anterior incision is made half an inch from the anal margin. The fibres of the external sphincteric muscle are exposed, and by means of a series of interrupted catgut sutures the muscle is pleated until the anal orifice is so narrowed that it admits the tip of the little finger only. The skin wound is thereafter closed and a Whitebread's varnish dressing applied. The bowels are kept confined for three days, and then opened by a castor-oil aperient followed by an olive-oil enema. The child is kept recumbent for fourteen days, and daily bowel evacuation is secured by means of a soap and water enema.

Ian Fraser² prefers the method of **Alcohol Injection**; fifty cases have been treated by this means with complete success. No previous preparation is required. Using a 1-c.c. glass syringe and a 1½-in. needle, ¼ c.c. of absolute alcohol is introduced at four equidistant points in the anal circumference, the injection entering the space between the mucous membrane and the muscle of the internal sphincter. The buttocks are strapped together for twenty-four hours, and a movement of the bowel is then secured. The benefit of the procedure arises from a stimulus of the musculature and the formation of adhesions between the mucous membrane and the muscular coats.

Imperforate Anus.—When a child is born with an imperforate anus the surgeon must decide whether he shall relieve the condition by gaining access to the blind end by the perineal route, or perform an inguinal colostomy. It is obvious that the decision should be governed by the degree to which the hind-gut has developed, and accurate information on this point is obviously important. O. H. Wangenstein and C. O. Rice³ suggest a method by which the information may be obtained. Two ordinary X-rays are taken, one in the vertical position, the other while the child is held inverted. In the latter position the gas in the lower part of the large intestine rises to the highest possible level, and so outlines the position of the blind end. The method is excellent in theory, and, if it affords accurate information on the position of the lower limit of the rectum, its value as a means of judging the best surgical access is obvious; but for the procedure to be successful it surely presupposes that the lower bowel is relatively empty as far as solid contents are concerned, while in actual experience it is usually found that the gut is filled with meconium—a finding which would seem to preclude the application of the method described above.

REFERENCES.—¹*Practitioner*, 1930, July, 90; ²*Brit. Med. Jour.* 1930, i, 1047; ³*Ann. of Surg.* 1930, July, 77.

RECTUM AND SIGMOID, STERCOLITHS (Fæcal Tumours) OF.

J. P. Lockhart-Mummery, F.R.C.S.

R. Bensaude and J. A. Lièvre¹ distinguish two types, according to the consistency of the mass, which they call 'stercoromes' and 'stercoliths'. The chief symptoms are tenesmus, painful actions of the bowels, and loss of proper control. The bowels act more or less without the patient's knowledge and at frequent intervals. There is a practically persistent desire to evacuate the bowels, which is frequently ineffective. These cases are often thought to be the result of paralysis or weakness of the sphincter muscle. The condition often occurs in elderly people and often after some severe illness. The cause is easily detected if a rectal examination is made. Treatment consists in frequent **Enemas** aided by oil injections, but if the mass is very hard it may have to be broken up with a curette before it can be got away.

REFERENCE.—¹*Progrès méd.* 1929, Nov. 16, No. 47.

RENAL AFFECTIONS, SURGICAL. (See KIDNEY.)

RENAL DISEASE.*Ivor J. Davies, M.D.*

Pathogenesis of Glomerular Nephritis.—W. T. Longcope¹ (Baltimore) has made a study of this subject. Bright's disease presents problems which in many respects resemble those of heart disease. During the last thirty years the complicated state called heart disease has gradually been resolved into several well-defined affections, each involving the heart in a special and recognizable manner. We have in consequence come to distinguish, as separate entities, rheumatic heart disease, syphilitic heart disease, hypertensive heart disease, and arteriosclerotic heart disease. The ultimate effect of all of these upon the circulation may be much the same, but each is distinct in etiology, in pathogenesis, and in its natural history.

Our information concerning Bright's disease to-day is in much the same state of confusion as was our knowledge of heart disease many years ago, for it is not yet clear whether we have to deal with a single process presenting itself both to the clinician and to the pathologist in a variety of forms, or whether under the term Bright's disease there are included several separate and distinct entities related only in so far as they produce bilateral non-suppurative lesions of the kidneys. Recent work has resulted in the general recognition of three great groups of kidney disease: (1) The degenerative lesions of the tubular epithelium called first by Müller 'nephrosis'; (2) The inflammatory lesions of the glomeruli, long known as 'glomerular nephritis'; and (3) The atrophic contractions of the kidney secondary to disease of the arteries and arterioles, known as 'vascular nephritis'. These may be translated into such a clinical classification as that proposed by Addis: (a) The degenerative; (b) The hæmorrhagic; and (c) The arteriosclerotic.

Longcope summarizes the information that can be obtained about primary glomerular nephritis as follows. The disease occurs in two forms—the focal and the diffuse. The focal form occurs during acute infections, and in the embolic type is usually ascribed to the deposition of bacteria in the capillary loops of the glomeruli, where they lead to a necrosis or to an inflammatory reaction. The diffuse form follows acute infections, proved to be due in such a large proportion of instances to hæmolytic streptococci that for the present it is justifiable to consider at least one variety of acute glomerular nephritis as a manifestation of streptococic infection. In view of the great frequency of acute streptococic infections, it must be considered as a rare manifestation. It cannot be proved that acute glomerular nephritis depends upon infection by a particular form of streptococcus or upon the invasion of the blood or the involvement of the kidney by streptococci. There is some evidence, however, which indicates that patients suffering from acute nephritis are abnormally susceptible to the products of the growth of hæmolytic streptococci; and it seems possible that some altered reaction of the tissue, such as occurs in allergy, or some unusual antibody response to the infection, is the determining factor in the development of acute glomerular nephritis in individual cases. Permanent recovery is apparently more common in children than adults; we have no observations to explain the difference. In a small number of adults we have found that recovery has followed elimination of the infection and the infecting organism, while progression of the disease has been coincidental with the persistence or the recurrence of hæmolytic streptococcus infections. It further appears evident that there are instances of Bright's disease that run their entire course as progressive or recurrent diffuse inflammatory glomerulitis, without involvement of the renal arteries or arterioles, and with changes in the renal tubules that may be regarded as secondary to the glomerular lesion and to the diffuse inflammatory reaction of the interstitial tissue. As a working hypothesis, therefore, we would suggest that it may be possible to

differentiate, as one form of Bright's disease, a primary and specific glomerular nephritis which is to be interpreted probably as a manifestation of streptococcus infections in individuals who may be allergic to the streptococcus or its products of growth, or who possess some other peculiar form of tissue response to a local streptococcal infection.

Natural History of Acute Glomerulonephritis.—E. Moschcowitz² (New York) describes the natural history of acute glomerulonephritis, and concludes that the disease has no prescribed course but has various clinical evolutions. These evolutions, as far as one can judge, are not the result of mutations in the morbid anatomy, but are the result of unknown factors. It is impossible to predict in the early stages in which direction the evolution will proceed, and it is hazardous, therefore, to make any prognosis either in regard to healing or the duration. In the majority of instances healing occurs, and the duration of the disease in such cases is only exceptionally over two months. If residual symptoms persist at the end of this period, the patient passes, as a rule, into the latent stage, which may last for many years, and in which there may be no signs or symptoms except a persistent albuminuria. Hypertension in this stage is often lacking. All evidence seems to show that the common cardiovascular hypertensive disease of middle life is not the result of a glomerulonephritis in childhood, unless there has been clinical continuity. When an acute glomerulonephritis heals clinically, apparently it remains healed. Anatomically, the healed lesions of acute glomerulonephritis are not definitely known. When death results, it may occur at any time between the first weeks and two—or perhaps more—decades. Acute glomerulonephritis may mask under the syndrome of pseudo- or transient arteriosclerosis, and many cases terminate in the syndrome of 'nephrosis'.

Incidence of Chronic Nephritis amongst Young People in Queensland.—D. G. Croll³ (Brisbane) has written on this subject, and L. J. J. Nye⁴ (Brisbane) in an investigation has shown that there is an extraordinary incidence of chronic nephritis in persons between the ages of ten and forty in Queensland.

1. The type of nephritis is a chronic diffuse sclerosis of the kidney tissue, and the name 'nephrosclerosis' is submitted as a more appropriate term.

2. In eighty consecutive case records of so-called chronic interstitial nephritis it was found that in fourteen there was a history of the patient's having received treatment for plumbism in childhood.

3. Of twenty-two patients who were interviewed, twenty had spent their childhood in wooden houses with chalky paint on the walls and railings, while sixteen were nail-biters or thumb-suckers.

4. It has been shown that the incidence of plumbism in Queensland is remarkably high.

5. Records have been made of the results of physical examination and renal function tests on twelve children who have suffered from previous lead poisoning, and on three who gave a history of frequently licking the rain-drops from the veranda railings after a storm. All of these patients exhibited renal insufficiency.

6. It has been shown that this nephrosclerosis is most prevalent where the houses are built of wood and where children are confined to the veranda.

7. It has been shown that there is a close association between houses painted with lead paint, nail-biters or thumb-suckers, lead poisoning, and chronic nephritis.

Diazo-colour Reaction in Uræmia.—I. M. Rabinowitch⁵ (Montreal) records his results with the diazo-colour reactions and draws the following conclusions: (1) A positive diazo-colour reaction is not found in any condition

other than severe kidney damage; (2) A positive reaction may frequently be found in persons with severe kidney damage, and such persons may recover. These cases include the albuminurias of severe infections, the well-recognized form of acute nephritis with pallor, oedema, etc., acute exacerbation of chronic nephritis, mechanical obstructions to the urinary outflow, surgical lesions of the kidneys with urine retention, and the anuria of diabetic coma; (3) When acute exacerbations of the disease are excluded, a positive reaction occurring in the course of chronic nephritis has invariably, at least in their experience, meant unfavourable prognosis. (4) When all of the aforementioned factors are given consideration the test is of value in differentiating uræmia from cerebral arteriosclerosis.

Indican Determination of Blood in Renal Insufficiency.—B. L. Monias and P. Shapiro⁶ (Chicago) have demonstrated the value of this form of chemical analysis of the blood in cases of renal insufficiency. In their series of 104 cases there was not a single one in which a marked accumulation of indican in the blood (+ 3 and + 4, corresponding to 2.5 to 5 mgrm. per 100 c.c.), failed to announce an approaching uræmia or one already present. Were the urea nitrogen and creatinine high or low, a marked indicanæmia spelled death in uræmia. On the other hand, if the indican reaction were weak or absent, then, even in spite of a high urea nitrogen and creatinine value, there was no danger of uræmia. The patient recovered or, if not, died of myocardial insufficiency, pneumonia, cerebral hæmorrhage, or any other condition than uræmia. We may conclude from this work that the determination of indican in the blood is a sensitive and specific test of absolute renal insufficiency, that is reliable in diagnosis and in prognosis. By use of the standards described, indican determinations are established as a quantitative laboratory procedure that is as accurate as the urea nitrogen or creatinine readings. A simplification of the method is described which enables the practitioner to make the determination of blood indican in his own surgery with adequate accuracy and with a minimum of time and effort.

Blood-count in 'Cardiovascular Renal' Disease.—B. Ashe⁷ (New York) has studied the percentage of hæmoglobin and the red-blood-cell count in Bright's disease, myocardial insufficiency, and hypertension. He concluded that the blood-count is of value in estimating the relative importance of the kidney, the heart, and the cerebral blood-vessels in inducing the combination of signs and symptoms which make up the different stages and types of 'cardiovascular renal' disease.

1. A secondary anæmia is invariably associated with and is directly proportional to the degree of impairment of renal function.

a. This relationship holds true for renal insufficiency from any cause. It applies whether the nephritis is acute or chronic, glomerular or diffuse, primary or secondary contraction, or whether the diminution of kidney function is due to conditions other than Bright's disease, as, for example, polycystic kidney or nephrectomy.

b. Hæmaturia, infection, albuminuria, oedema, myxœdema, restricted protein intake, etc., produce an anæmia which occurs independently of the lowered red-cell count that accompanies impaired renal function; all these influences must be considered in interpreting the significance of the blood picture.

c. In a small proportion of the cases with marked and maximal renal insufficiency, the anæmia is characterized by a colour index greater than 1. The possible relation of this feature to pathological changes in the liver is discussed.

2. The blood-count may furnish a clue as to the coexistence of congestive myocardial failure or cerebral lesions.

a. The cardiac cases exhibit a low hæmoglobin percentage which in a measure parallels the renal insufficiency, while the red-cell count is normal or relatively high even when the kidney impairment is extreme; the colour index in cases of myocardial failure is, therefore, distinctly low.

b. The 'cerebral' cases are characterized by a high normal or polycythæmic blood-count (of hæmoglobin as well as of red blood-cells) whether the kidney function is normal or markedly damaged. This serves to distinguish these hypertensive cases from those in which the kidney lesion or the myocardial insufficiency is the dominating factor.

Renal Insufficiency Associated with Bence-Jones Proteinuria.—E. G. Bannick and C. H. Greene⁸ (Mayo Clinic) report a study of thirteen cases of this condition and emphasize the frequency of the association. The usual clinical picture is that of marked proteinuria, rather marked secondary anæmia, nitrogen retention, delayed excretion of phenolsulphonaphthalein, little or no œdema, and little or no hæmaturia, hypertension, or retinitis. This picture seems usually to be the result of destructive processes in the kidney, either tubular destruction with subsequent fibrosis or pyelonephritis. Associated arteriosclerosis and hypertension may occur in some cases. The occurrence of true glomerulonephritis is rare. The urine should be examined for Bence-Jones proteinuria in all patients presenting the group of symptoms just mentioned and in all cases in which profound proteinuria exists, especially when associated with anæmia. In this way many cases of Bence-Jones proteinuria will be recognized which at the present time are being overlooked. This in turn will provide more data for the study of the nature of the renal insufficiency. The presence of Bence-Jones protein in the blood has been demonstrated in approximately 70 per cent of the cases in which examination as suggested has been reported. Hyperproteinæmia is present in a smaller proportion of cases. There apparently was no constant relationship between this condition and the presence or absence of demonstrable renal insufficiency.

High-grade Anæmia in Chronic Nephritis.—E. P. Scarlett⁹ (Iowa City) discusses the significance of this phenomenon. Four cases of severe chronic glomerular nephritis with uræmia are reported in which hypertension, cardiac hypertrophy, and retinal changes did not occur, and in which anæmia was the single cardinal clinical finding. The cases illustrated the parallelism in chronic nephritis between blood-nitrogen retention and marked anæmia. Three of the cases died within a year from the time of being seen. This fact serves to emphasize the importance of anæmia as a grave prognostic sign.

Diet in Chronic Nephritis.—A. A. Osman¹⁰ (London) discusses the question of diet in chronic nephritis, and concludes that it is not of great importance in the treatment. It is of some advantage to select base-forming foods rather than acid-forming foods as far as possible. Moderate protein restriction may be used with advantage in chronic interstitial nephritis, but drastic curtailment is unnecessary, as its excess of acid-forming properties can be neutralized by suitable and easily ascertainable doses of alkalis. Dietetic measures are of no marked practical value in preventing renal damage. Potatoes, oranges, raisins, apples, and bananas are found to be among the most important base-forming foods. Among the most important acid-forming foods are rice, whole-meal bread, oatmeal, meat, and eggs.

Nephrosis: a Critique.—H. A. Christian¹¹ (Boston) adopts the following conception of nephrosis as a clinical condition:—

1. Given a considerable and prolonged protein deficit in the blood, œdema, lowered blood-protein, relative increase in blood-globulin at the expense of albumin, hypercholesteræmia, and lowered basal metabolism will appear—not always in the same order, and possibly in varying degree.

2. The most common cause for such blood-protein deficit is marked and prolonged albuminuria.

3. The cause of such albuminuria is a renal lesion.

4. Often this renal lesion is obviously in the glomeruli, but in many reported cases, mainly those patients dying of infection relatively early in the course of the disease, the glomeruli show very slight or no demonstrable lesions, while there are extensive degenerative changes in the tubules. For the latter, knowing what we do of renal physiology, and believing that the actual daily amount of albumin in the urine of many of these patients is in excess of what could possibly come from degenerating renal epithelium, the author is of the opinion that the source of the albuminuria is in the passage of albumin through the walls of blood-vessels, most probably glomerular capillaries, a functional change in a colloid membrane of which the microscope gives no evidence. Obviously this explanation is mere surmise.

5. Holding these views, there seems to him to be no justification for regarding nephrosis as other than a variety of kidney disease, a form of chronic nephritis (Bright's disease).

'Lipoid Nephrosis.'—H. Gainsborough¹² (London) has made a study of so-called lipoid nephrosis. This name was first used by Müller as a purely pathological distinction between degenerative and inflammatory parenchymatous kidney change. Aschoff and others have raised the question whether this is a disease of the kidney or a general disease in which the kidney is involved. The following conclusions are drawn from Gainsborough's contribution: (1) Subacute or chronic parenchymatous nephritis is marked by an initial stage with œdema, and a late stage with cardiovascular change and nitrogen retention. (2) The initial stage, which may be long or short, is associated with disturbance of the protein and cholesterol distribution in the body and with a lowering of the basal metabolism. There is generally a secondary anemia and a moderate leucocytosis. (3) In the later stages these characteristics tend to disappear. (4) Rarely, the later stage does not appear to develop. (5) There is no necessity for the conception of 'nephrosis' as a distinctive entity from nephritis. (6) As it is a possibility that the œdema and also the metabolic features of this disease might well be explained by the disturbance of the composition of the plasma following prolonged heavy albuminuria, it is unnecessary to hypothesize unknown extrarenal factors until this possibility has been further explored.

R. W. Buck¹³ (Boston) discusses the theories, symptomatology, and clinical pathology of nephrosis. He suggests that the clinical use of the term should be limited to the diagnosis of lipoid nephrosis, inasmuch as this is the nephrosis of chief clinical importance which can be diagnosed with certainty. The demonstration of doubly refractile lipoids in the urinary sediment is essential for this diagnosis.

Thyroxin in the Treatment of Nephrosis.—The inquiry of R. Platt¹⁴ (Sheffield) into the fate of thyroxin in the treatment of nephrosis may be summarized as follows: (1) It is a well-known fact that patients suffering from chronic nephrosis exhibit an extraordinary tolerance to thyroxin, whether administered orally or intravenously; (2) Experiments are described which in the author's opinion demonstrate that this is not due to rapid excretion of thyroxin by the kidney; (3) It is therefore presumed that thyroxin is either rapidly destroyed in the body or its action inhibited, but it is suggested that such an inhibition does not depend upon the increased level of the blood-cholesterol which is commonly found in these cases.

The Selection of Diuretics.—L. G. Rowntree¹⁵ (Mayo Clinic) discusses the most important diuretics and the various pathological states in which they

are indicated. In practice each patient must be considered individually and each case of œdema accounted a distinct problem. In this connection Rowntree quotes a statement of Sydenham's with which all are agreed: "The chief weakness of medicine is not our ignorance as to the ways and means by which certain indications may be satisfied, but our ignorance of the particular indications that thus want satisfying. How I can make a patient vomit, and how I can purge or sweat him, are matters which a druggist's shop-boy can tell me off-hand. He can tell me, too, how to cool a man when he is heated. When, however, I must use one sort of medicine in preference to another requires an informant of a different kind—a man who has no little practice in the arena of his profession."

Nephrosis.—The administration of **Ammonium Chloride** by mouth in combination with the intravenous use of **Merbaphen (Novasurol)** has given excellent results in the treatment of nephrosis. Epstein has advised a diet high in protein and low in fat. Urea has been employed with success in some cases at the Mayo Clinic, especially in the treatment of children. A large proportion of these patients recover eventually.

Myocardial Insufficiency; Chronic Passive Congestion.—The most important consideration is re-establishment of circulation. In this connection derivatives of **Digitalis** and **Caffein** are most useful. **Rest** and restriction of water and salt also are indicated. **Urea**, **Merbaphen (Salyrgan)**, and **Ammonium Salts** are valuable in treatment. Urea was used in doses of 60 to 90 grm. a day, and deserves a larger place in the treatment of cardiac œdema.

Nephritis.—A combination of œdema and uræmia is frequently encountered in acute, subacute, and chronic nephritis and infections of the kidneys. In acute nephritis emphasis should be laid on absolute **Rest** in bed, restriction of activity, control of **Diet**, and maintenance of **Warmth**. Diuretics may be necessary. If used at all, **Purin Derivatives** and hypertonic solutions of **Sugar** are perhaps best. Foci, such as infections in the tonsils or sinuses, may demand attention. In acute, subacute, and chronic cases **Euphyllin** is often of decided value, and in older persons **Digitalis** may prove helpful.

Edema due to Extrarenal Factors.—Recently considerable progress has been made in the control of ascites in cirrhosis of the liver, Banti's disease, and polyserositis, through the use of **Merbaphen** and **Ammonium Salts**.

Familial Polycystic Disease of the Kidneys.—C. J. Fuller¹⁶ (London) reports a series of cases of this condition where the disease has been shown to exist through four generations in succession. Cairns has recently reported a series, and at the same time extracted from the literature the accounts of families similarly affected. One of the most striking points emphasized by Fuller's series is the remarkable absence of symptoms in individuals whose kidneys are severely damaged. That there is a definite decrease of renal efficiency with increasing age is demonstrated by the results of the urea-concentration tests. The urine of the affected members shows fairly constant alterations. Although hæmaturia is a not infrequent sign of the abnormality, red blood-cells were present in only one case. Albumin, on the other hand, was a constant finding, although never in large amount. The other interesting fact is the frequency with which pus-cells were found. The apparent effect on the cardiovascular system is interesting. In the one case in the second generation whom Fuller examined the blood-pressure was high and there was evidence of changes in the retinal blood-vessels, but owing to the age of the patient (74) it would be unwise to draw any definite conclusions. In another instance the case is different, for here is a man of 40, who has no evidence of any renal lesion apart from the one under discussion, with a blood-pressure of 185 mm. Hg, and symptoms indicative of a poor exercise tolerance. That

his kidneys are badly damaged is shown by the inefficient manner in which urea is excreted by them. The other members of that generation all tend to show a blood-pressure which is slightly higher than normal.

Mechanism of Diuresis produced by Ingestion of Water.—L. Ambard and F. Schmid¹⁷ (Strasbourg, France) discuss this subject, and from their observations conclude that when water is administered by mouth it leads, during its absorption into the body, to the liberation of a hormone from the intestinal mucosa. This hormone is a diuretic and it produces polyuria by acting directly upon the kidney cells.

REFERENCES. ¹*Johns Hopkins Hosp. Bull.* 1929, Dec., 335; ²*New Eng. Jour. Med.* 1930, Feb. 13, 320; ³*Med. Jour. of Australia*, 1929, Aug., 144; ⁴*Ibid.* 145; ⁵*Arch. of Internal Med.* 1930, Feb., 282; ⁶*Ibid.* April, 573; ⁷*Ibid.* 1929, Oct., 506; ⁸*Ibid.* 486; ⁹*Amer. Jour. Med. Sci.* 1929, Aug., 215; ¹⁰*Guy's Hosp. Rep.* 1930, Jan., 61; ¹¹*Jour. Amer. Med. Assoc.* 1929, July, 23; ¹²*Quart. Jour. Med.* 1929, Oct., 101; ¹³*New Eng. Jour. Med.* 1929, Nov. 14, 973; ¹⁴*Quart. Jour. Med.* 1929, Oct., 129; ¹⁵*California and West. Med.* 1929, Aug., 103; ¹⁶*Quart. Jour. Med.* 1929, July, 567; ¹⁷*Canad. Med. Assoc. Jour.* 1929, Sept., 265.

RENAL RICKETS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The reviewer refers to the condition mentioned in recent medical and surgical literature as renal rickets. It has three outstanding features: (1) Renal deficiency, usually due to chronic interstitial nephritis, cystic disease, or congenital hydronephrosis; (2) Infantilism and stunted growth; (3) Changes in the bones which resemble, but are not necessarily identical with, those seen in the rachitis of adolescence. The renal insufficiency, whether due to congenital or other causes, occurs in the very early years of infancy. Growth may hesitate or cease in the early years of life or may not become apparent until later, and similarly the rickety changes in the bones may be noticed in early childhood, or may not become evident until early adolescence.

Renal infantilism without rickets, like celiac infantilism, has been noted and recorded by many authorities as a definite entity. Miller, Webster, and Perkins,² in describing celiac infantilism, include pancreatic, intestinal, hepatic, and biliary conditions. It is interesting to note that amongst their cases is a description of a dwarf of 7 in whom rickety changes occurred in the long bones. It is referred to as late rickets associated with celiac infantilism. Tests of renal function were not mentioned. Early writers have noted a connection between rickets and chronic interstitial nephritis, and in unrecognized cases deaths from uremia have not been infrequent after osteotomy for the correction of bony deformities. It is only in recent years that renal insufficiency, stunted growth, and rachitic changes in the bones have been grouped definitely under the term 'renal rickets'. Fletcher³ appears to be the first to have definitely correlated rachitic deformities with chronic interstitial nephritis.

A typical case of renal rickets has, according to G. V. Ashcroft,⁴ a definite clinical picture, a definite X-ray picture, and a definite post-mortem picture. Furthermore, the blood chemistry and urinary findings, although variable, show uniformity in typical cases which is very suggestive. Knock-knee is a common deformity, but all manner of curves may be seen in the long bones. Bow-legs are uncommon. The urine is acid with a low specific gravity, and often contains a small amount of albumin, hyaline casts, and red cells. Albumin may be absent or only found periodically. The result of urine analysis depends upon the nature of the renal lesion. Cardiovascular disease is conspicuous by its absence. The blood-pressure may be slightly raised as in the case recorded by H. A. Swart,⁵ but it is more often lower than normal. The Wassermann reaction is consistently negative. X-ray examination in a typical case shows a

process of rarefaction, usually an absence of cortex (in Swart's case the cortex was thickened), and metaphysial changes which vary in many cases from the usual rickets type. At the wrist-joint, for example, the radius and ulna are devoid of cortex. The distance between the epiphysis and the metaphysis will be found much greater than normal, and the space between has a 'woolly' appearance. Changes of various types associated with active rickets may also be seen. Transverse fractures and periosteal cracks in the long bones have been noted in a number of cases. X-rays of the skull show a normal pituitary fossa, but marked thickening of the flat bones suggestive of Paget's disease. The X-ray findings in Swart's case were markedly different from those seen in true infantile rickets. At post-mortem small red kidneys are the usual findings; sometimes both together may weigh less than one ounce. Sometimes the kidneys are cystic, and sometimes calculi are present. The long bones split easily with a knife owing to absence of or deficiency in the cortex; the marrow is pale and fatty; and the spaces which are normally occupied by cartilage cells are filled with fibrous tissue. It has been mentioned by some writers that there is fibrosis of the suprarenal gland and that the thyroid gland is inactive, and it is suggested by Swart that the rôle of the parathyroid requires further investigation. He suggests the possibility of renal insufficiency stimulating the parathyroid gland to overactivity. The skeletal changes might be accounted for in this way.

The blood chemistry is interesting. It appears that the blood-cholesterol is often two or three times above normal, and that the blood-calcium is low as compared with the blood-phosphorus. The blood-urea is high, and urinary concentration tests indicate the renal insufficiency. Unless considered with other factors, blood-urea estimation is not of any serious clinical importance. A small amount of renal tissue will prove sufficient to maintain health. Some of the kidney may be irreparably damaged, but there is a residue not yet embarrassed. This residue with the help of reserve glomeruli is capable of double work (Wheeler⁶). In Swart's case the estimation of serum-calcium and serum-phosphorus was not of real value; both approached normal.

Swart's paper is most instructive, and, *inter alia*, he states that it may be argued that these cases vary too much to be classified under one heading; but since there are no other criteria for differentiation, and because they have come to be known by the name of renal rickets, the various gradations had better be grouped together rather than separated.

The reviewer has under his care at the time of writing two cases in which the diagnosis of renal rickets was made provisionally on clinical grounds. The first case, age 7, was dwarfed. *Plate L, A*, shows the child beside a healthy child of the same age. At one time albumin, red cells, and hyaline casts were found in the urine taken by catheter. On other occasions the urine was found normal. Rickety changes were noticeable about the head and chest, but the long bones and bones of the skull were normal. The blood chemistry was against the diagnosis of renal rickets. Calcium, phosphorus, and cholesterol approached normal. The Wassermann reaction was full positive. The findings in this unusual case are probably due to congenital syphilis and not to renal rickets. The second case (*Plate L, B*), age 17, also dwarfed, is seen standing beside a healthy girl of approximately the same age. She suffered from double congenital hydronephrosis with a stone in the left kidney. The X-ray report after injection of uroselectan stated that there was marked dilatation of the pelvis and calices of both kidneys, but especially of the right on the side opposite to that containing the stone (*Plate L, C*). At operation for removal of the stone the parenchyma of the left kidney was found small and atrophied, but the pelvis and calices were dilated. Rickety changes were marked in the long

PLATE L

RENAL RICKETS

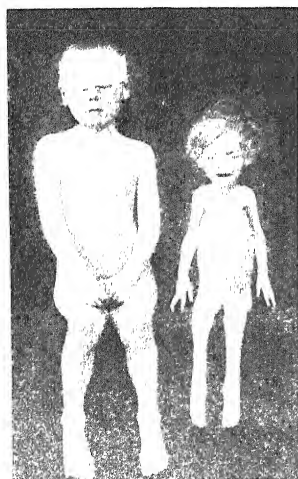


Fig. A. Suspected renal rickets. Dwarf, age 7, sitting beside child of same age (*see text*.)



Fig. B. Renal rickets. Patient, age 17, standing beside girl of same age.



Fig. C. Skiagram of same patient as *Fig. B* after intravenous injection of tiroselecan. Stone in left kidney; double congenital hydronephrosis; scoliosis.



Fig. D. Skiagram from same case, showing outward curving of both tibiae and fibulae; cortex ill-defined.



bones (*Plate L, D*) and spine. The bones of the skull were normal. Several osteotomies were performed in different hospitals without success. The blood chemistry was again against the diagnosis of renal rickets, but the writer believes that this case should be grouped under that heading on account of the definite dwarfism, the definite renal condition, and the somewhat characteristic condition of the bones.

DIFFERENTIAL DIAGNOSIS.—The presence of polyuria and polydipsia in cases of renal rickets has led to a diagnosis of diabetes insipidus. When adiposity is present Fröhlich's syndrome is to some extent mimicked. Hyperthyroidism, early osteomalacia, and juvenile Paget's disease require consideration. Congenital syphilis may lead to diagnostic error.

TREATMENT.—There is no satisfactory treatment. Operative treatment is contra-indicated. Antirachitic measures, such as **Sunlight** and **Cod-liver Oil**, are believed by some authorities to precipitate uræmia.

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RETINAL DETACHMENT.

W. S. Duke-Elder, M.D., F.R.C.S.

It can be truly said that detachment of the retina has up to now been a condition in which the ophthalmologist could offer little or no hope of successful treatment. The number of the methods of treatment which have been proposed from time to time, and their rapid disappearance from the field of therapeutics, form sufficient evidence of their practical valuelessness, and the usual policy of despair which has been adopted of keeping the patient recumbent for a period of many weeks with (generally) negative results speaks eloquently for itself. During the past year, however, a method has come into general use which appears to hold out considerable hope for the successful treatment of a large class of retinal detachments. A valuable contribution to our knowledge of this subject was made many years ago by English surgeons that conservative treatment rarely held out any hope of success in the case of a retinal detachment in which there was a hole; Professor J. Gonin, of Lausanne, conceived the obvious corollary that, if this hole were closed, detachments of this type might well be amenable to cure. With this end in view he devised an operation to obliterate the hole by **Ignipuncture**, and although it must not be imagined that the method outlined below is invariably successful, his own experience and the experience of those who have followed him would suggest that, instead of the disease being practically hopeless, there is now a fair chance of accomplishing a cure for it.

The essential point in the new method of treatment is the finding and localizing of the hole in the retina. It cannot be insisted upon too strongly that in this lies the whole secret of success. The great majority of simple retinal detachments have a hole, especially those following trauma in myopic eyes—in fact the formation of a hole by some minor trauma at the site of an area of degeneration or inflammation in the retina appears to be the immediate cause of most detachments of this type. The hole is sometimes extremely difficult to find, and repeated careful examination on many occasions under full mydriasis ought to be undertaken in the search for it before it is finally decided that it does not exist. Examination by red-free light is frequently of value, since in this light the margins of the hole are contrasted more distinctly against the choroid. The hole may be of several types: the usual shape is a horseshoe rent which may vary enormously in size; small round holes are also frequent, especially in relation to an area of choroiditis, and tears (frequently of considerable dimensions) are common at the ora serrata

(the 'retinal disinsertions' of Gonin). It is to be remembered that the hole may be situated far from the actual detached area; commonly the former is in the upper part of the fundus, and, owing to the effect of gravity upon the subretinal fluid, the detachment occupies the lower part. A second important point is that the finding of one hole does not exclude the possibility of multiple ones being present; and since this method of treatment offers no hope of success unless every hole is occluded, the clinical examination should proceed with the utmost thoroughness after a hole has been found.

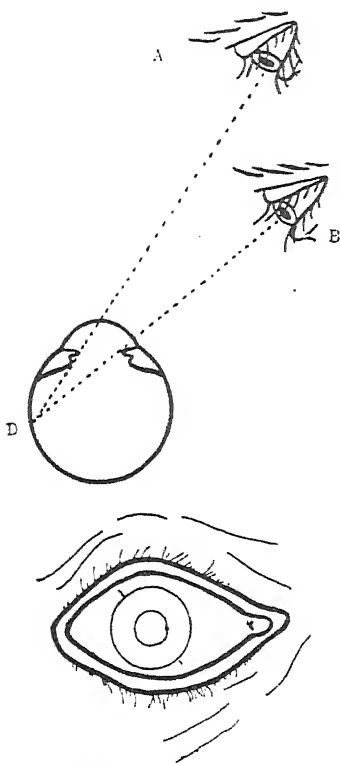


Fig. 49.—Method of locating the meridian of the hole in the retina. The upper figure shows the method of localization by the ophthalmoscope suggested by Rubbrecht. The lower figure shows the meridian marked out on the limbus with Indian ink.

(By kind permission of the
British Journal of Ophthalmology.)

Once the hole is found, the next stage is its accurate localization. Several complicated methods have been devised to assist in this process, but it is probable that the best results can be obtained by the simple ophthalmoscopic method of Gonin. His procedure is to mark with a stain of dye (such as methylene blue or Indian ink) at the limbus at opposite points of the cornea the exact meridian in which the hole is situated. The actual point on this meridian is obtained by measuring ophthalmoscopically the distance of the hole from the ora serrata in disc diameters. The site of the ora serrata (that is, to all practical purposes, the extreme peripheral limit of the fundus as seen ophthalmoscopically under full mydriasis) is taken as 8 mm. behind the limbus, and since each disc diameter is 1.5 mm., the appropriate distance is added to this. Thus if the hole is 3 disc diameters from the periphery of the fundus, it would lie $8 + (3 \times 1.5) = 12.5$ mm. behind the limbus on the meridian in question. At operation a large conjunctival flap is turned backwards, and, the meridian being indicated by a suture running between the two marked points on the limbus, the actual site of the hole is found by laying a pair of dividers, which are fixed open at the calculated distance, along the line of the suture with one limb resting upon the corneal margin. (Fig. 49.)

It must be admitted that this method of localization is somewhat haphazard and depends to a large extent on experience: yet in practice it works. R. Rubbrecht has suggested an ingenious modification for finding the meridian (Fig. 49). If the hole is at

D, the observer at A sees it projected on the edge of the dilated pupil and marks the corresponding point on the limbus. The observer then changes his position to B and sees the hole projected at the side of the pupil directly opposite that already noted; this also is marked, and the two points thus determine the meridian. Weve has described a complicated method whereby the hole is located with a fixed ophthalmoscope and optical system; a model of the eyeball in glass is then put in the same position

as the eye of the patient, and, the ophthalmoscopic system remaining fixed, the corresponding point is shown on the surface of the artificial eye. From this it can be transposed to the living eye by direct measurement. K. Lindner has devised a method employing the Gullstrand ophthalmoscope for the purpose of localization; and several other methods have appeared.

Once the hole is found and located, the actual technique of the operation is simple. A conjunctival flap is reflected and the site of the hole marked by methylene blue. An incision through the sclera is made by a von Graefe knife and the subretinal fluid allowed to escape; a cautery at bright-red heat is thrust through the opening, retained for a second, and then withdrawn, and the conjunctival flap sutured. Atropine is instilled and the patient is put to bed for four to five days, preferably in such a posture that the detachment is in the most dependent position. In the operation Gonin himself uses a Paquelin cautery; most others use a galvano-cautery. [Personally I have found the latter much more simple to use and much less prone to cause one of the common post-operative complications—that of hæmorrhage.—W. S. D.-E.] The essential point in the operation is that the rent in the retina should be included in the cautery scar and thus permanently sealed off. If this has not been successfully done, the operation must be repeated; but in subsequent attempts the exact localization of the hole is much facilitated by mapping it out from the site of the previous scar, which is readily seen both in the fundus and upon the sclera.

There are several limitations to this procedure. It is applicable only to those cases in which a retinal hole can be found which can be reached by a cautery. This immediately rules out any detachment in which a hole is not visible. Moreover, although it is possible to reach for a very considerable distance posteriorly, more especially if a rectus muscle is detached for the purpose, all cases wherein the hole occurs in the posterior half of the eye are ruled out. The hole may be too large to be sealed by one cauterization, and if multiple holes exist, the ultimate success of treatment depends on the willingness of the patient to submit himself to long and tedious treatment and on the ability of the eye to withstand repeated and severe trauma. Finally the retina may, and often does, go back, but the patient does not always find that vision is greatly improved—a somewhat disappointing result, but one which must be compared with the probable result of an unresolved detachment, which is usually followed eventually by the development of a complicated cataract and complete functional loss of the eye.

The immediate operative complications are few: a loss of vitreous at the time of operation is to be avoided. The cautery must not be inserted too far into the eye or retained within it for too long a time, for if this precaution is not taken, vitreous opacities are prone to develop, or an area of necrosis may occur in the surrounding retina which may cause the formation of fresh holes. Finally, post-operative hæmorrhage may occur. This last is the most frequent complication, and may occur three or four days after the operation. [In my experience, however, the risk is much less with the galvano-cautery than with the more unwieldy Paquelin. Grave hæmorrhages, however, appear to be rare. I have seen one such case only which had been operated upon in Switzerland and which necessitated removal of the eye eight months after operation; and Gonin reports 12 instances in 300 operations.—W. S. D.-E.]

With regard to the immediate results, the statistics published by Gonin (who has experience of 240 cases), and A. Vogt, and others show a percentage of successes of from 40 to 50. At Moorfields Hospital, where over 45 cases have been operated upon during 1930, the figure is the same (40 per cent); and it is to be remembered in the latter case that the list includes

by no means favourable cases only. With regard to ultimate results, little, of course, can be said. Gonin has had experience of seven years, but the cases of others are of comparatively recent date. All that can be said in the meantime is that the method, if practised with sufficient care, offers more hope to those suffering from this grave condition than any other procedure. The reviewer's personal experience corresponds with that to be found in the literature; there are more authentic records of cures of retinal detachments published during the past year than can be put to the credit of all other methods of treatment during the last twenty years.

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RHEUMATISM AND ARTHRITIS. (*See also* ARRHYTHMIA; GONORRHEA; JUVENILE INFECTIONS, DIATHESIS IN.) *Ivor J. Davies, M.D.*

J. A. Glover¹ (Ministry of Health, London) delivered the Milroy Lectures before the Royal College of Physicians in London, and described the incidence of rheumatic disease. These lectures should be clearly studied by insurance practitioners. It was shown that if 5 per cent approximately represents the proportion who suffer with rheumatism of all patients seen in ordinary practice, the proportion of invalidity (measured by duration of sickness) due to rheumatism is much higher—three times as great, or about 14 per cent of the total duration of all industrial sickness.

The classification into three groups and nine diseases was afterwards recommended as a working classification for international use, pending further etiological knowledge, by the International Committee on Rheumatism. The scheme of classification is as given below (the salient symptoms of each disease shown in the text are omitted). The determination of the type of arthritis may profoundly affect the treatment.

- | | |
|---------|---|
| Group A | <ol style="list-style-type: none"> 1. Rheumatic fever (acute rheumatism) 2. Subacute rheumatism (a mild attack of acute rheumatism and often accompanied by endocarditis) |
| Group B | <ol style="list-style-type: none"> 3. Muscular rheumatism (myalgia), including fibrositis, pleurodynia, and torticollis, but excluding lumbago 4. Lumbago 5. Sciatica and brachial neuritis |
| Group C | <ol style="list-style-type: none"> 6. Rheumatoid arthritis (infective peri-arthritis) 7. Osteo-arthritis, including morbus coxae senilis 8. Gout: (a) acute, (b) chronic 9. Unclassified cases of chronic joint changes which cannot be allocated to any of the above |

The rheumatoid arthritis category of this classification corresponds generally with the 'proliferative' type of arthritis of Nichols and Richardson, now perhaps more generally called 'atrophic arthritis' in America, whilst our 'osteo-arthritis' corresponds to the 'degenerative' type of Nichols and Richardson, now more generally there called 'hypertrophic' arthritis. On the Continent the rheumatoid arthritis syndrome is usually described as 'primary chronic arthritis', though cases (which seem commoner in some countries than in

England) in which typical attacks of acute rheumatic fever seem, instead of clearing up as usual, to pass immediately into a progressive form of chronic arthritis, are termed 'secondary chronic arthritis'.

Glover also showed² the immense incidence of the non-articular manifestation of chronic rheumatism, and that chronic arthritis, inconspicuous in mortality and hospital statistics, is, nevertheless, one of the greatest factors in the production of suffering and invalidity, and that together the rheumatic diseases cost fully one-seventh of the total financial burden of industrial sickness. Can anything be done to reduce this great incidence of chronic rheumatic disease? Here are great numbers of people suffering from fibrositis and chronic arthritis, both of which are pathological conditions produced like, say, food poisoning or bronchitis, by a variety of agents and causes. Of these factors, diathesis, faulty metabolism, trauma, occupational stress, mental stress, senile change, and derangement of endocrine balance seem all to be important; but focal sepsis appears to be the chief, and there is evidence in more than half of all cases that it has played a leading part. Time in the treatment of chronic arthritis is almost everything. The need for a most careful search for an infecting focus is paramount. Even in gout an infective focus plays an important part in activating the metabolic process, and so precipitating the attacks. The complete investigation of the possible causes of arthritis may be a long and difficult matter, requiring a regular 'team' of specialists. Once discovered, the removal of a focus may be equally a matter for the utmost care. For all this elaborate diagnostic investigation, and for the treatment and removal of the foci found, to be undertaken under the most favourable conditions, an 'arthritis unit' seems to be almost indispensable. The recent opening of the new Regent's Park Physical Treatment Centre for Rheumatic Diseases was memorable, and the Centre is capable of dealing with hundreds of patients a day.

The present state of our knowledge of arthritis has been admirably summarized by R. Pemberton³ (Philadelphia), to whose research work in this group of affections we owe so much. There is a world-wide awakening of interest in rheumatic conditions. The Red Cross Clinic in London and the American Committee for the Control of Rheumatism, to mention only two of the national organizations already formed, are significant of the universal effort made to combat these crippling and devastating diseases. We are to-day, as Pemberton states, in the struggle against arthritis much in the same position of Trudeau fifty years ago in the fight against tuberculosis. Interest and investigation in this great field have not kept pace with the general advance in medicine. Pemberton compares the attitude of the profession in the past to that of the rustic in one of Horace's odes—"Rusticus exspectat dum defluit amnis" ("The rustic waits for the stream to run by").

In etiology Pemberton very rightly emphasizes the fact that focal infection is only an episode in the causation of the disease. The constitutional conformation or diatheses, the physiological and chemical upsets, must also be considered. A comprehensive view is an absolute necessity for success. Much remains to be learnt, but much may be done through valuable measures already known and proved. The current knowledge of the subject has been fully described in recent issues of the MEDICAL ANNUAL. It is only possible now to refer to treatment as reviewed by Pemberton. The rôle of focal infection is, of course, no less important, but is now subject to the limitation already indicated. The general physiological disturbance persists, and must be corrected as far as possible before permanent results can be achieved. Pemberton insists on the absolute necessity for systemic **Rest** in the aim of restoring physiological balance. The avoidance of fatigue is an absolute necessity, as

it is also an expression of toxicity and must be considered when active measures of physiotherapy are adopted. This injunction is perhaps opportune, as in our enthusiasm for energetic local or general treatment in any affection we are apt to forget the liability to increased bodily fatigue. A just sense of proportion is a principle which should never be overlooked. The value of **Physiotherapy** is just beginning to be appreciated by the profession as a whole. Massage and heat have been used for centuries, but now require precision in prescription and application. **Vaccine Therapy** and **Non-specific Protein Therapy** have their appropriate use, and should be applied with a balanced appreciation of the nature of the disturbance and what they may be expected to accomplish. The limits and dangers of physiotherapy constitute part of the lesson to be learned in relation to that field; and, by the same token, the limits and dangers of vaccine therapy are also to be kept in the foreground. The treatment of the gastro-intestinal tract through diet, drugs, and colonic irrigation is at least of equal importance. The public now appreciate this fact, and Pemberton states that the laity are flocking (presumably in America with their well-known vogue for cures) to the many establishments given over to colonic irrigation, facetiously referred to as 'colon-filling stations'.

Drug therapy in general is of limited value. **Salicylates** relieve pain only, but in very early stages may be useful to restore a perverted physiology to normal, and upon restoration of function the physiological balance of health may be maintained. **Arsenic** supersedes the salicylates in value, and its influence upon metabolism and blood regeneration may be most beneficial. Ortho-iodoxy-benzoic acid, Pemberton states, has not justified the claims made for it by some writers. In conclusion Pemberton reaffirms the need for a wide-angled view-point in considering the rheumatoid problem; to co-ordinate the various sound measures of therapy critically and more frequently than is usually the case; and to appreciate that at last analysis it is not necessarily the removal of a focus or usually any single agent, but rather a restoration of physiology along the many lines indicated, which ushers the chronic sufferer from arthritis into channels of recovery. The haphazard and often useless or even aggravating treatment of the arthritic should now be a thing of the past, in view of the remarkable extension of our knowledge of these dire affections previously designated as 'rheumatism'.

It is probable, as Sir William Willcox⁴ suggests, that chronic rheumatism in one or other of its various forms is not less prevalent, and may even be more frequent and commensurate with the remarkable increase in longevity and expectation of life during the last hundred years. Exact statistical evidence is unavailable, but the Ministry of Health Report, 1924, gives the most reliable figures at present existent as regards the incidence of chronic rheumatism amongst industrial workers. The total length of sick absence caused by rheumatic diseases was for males one-sixth and for females one-seventh of the total sick absence due to all diseases. The report mentioned the high occurrence of lumbago in males, which comprises 33 per cent of the total rheumatic cases, compared with 12.9 per cent in females; and the high occurrence of rheumatoid arthritis in females, which comprises 13.1 per cent of the total rheumatic cases compared with 4.7 per cent in males. The report states that the difficulties of estimating the effect of occupation upon the incidence of rheumatic disease in such an inquiry are well-nigh insuperable. Willcox remarks that "the confusion of sciatica for arthritis of the hip is a very common mistake in diagnosis. . . . Fibrositis of the lumbar and pelvic muscles or tendons can always be determined on palpation. This is commonly confused with sciatica and arthritis of the hip." Bursitis should not be confused with arthritis. X-ray examination of joints should always be made when arthritis

is suspected. A careful search should always be made for an infective focus. Radiography should supplement the ordinary dental examination. Dental sepsis remains far too frequent amongst the industrial population. Compulsory dental treatment is perhaps only possible in hospital. The reviewer has found in hospital that, if no other treatment be given until dental treatment is undertaken, a refractory patient is countered. Septic stumps of previously removed tonsils are not infrequently the cause of arthritis. Investigation of the accessory sinuses can only be properly performed by a nose and throat expert. Intestinal infection is often the primary focus in elderly patients. A careful bacteriological examination should be made of the colon washings, as the signs of an active colitis are usually absent. Urogenital causes in both sexes should be remembered.

G. L. Kerr Pringle⁵ (Harrogate) presents a summary of 2000 cases of rheumatic disease. The importance of early diagnosis and treatment is stressed. Unfortunately, the affection is not seriously regarded by the laity or the profession until crippling occurs. Treatment must not stop with the removal of an infective focus as, in fact, it is only just commencing. Dental treatment should not be precipitate and drastic, or it may lead to disaster in a debilitated subject. It is wiser to remove one or two teeth at a time at intervals of a week. It is evident from his review that the correct management of these cases can only be done properly at a spa, and if undertaken at a general hospital, the spa methods should be followed as closely as possible.

F. Cronin Lowe⁶ (Liverpool) examined 100 cases of varying degrees and types of rheumatic disorder for evidence of *focal and bacterial infection*, employing the pathogen selective culture method. An average of three specimens were examined in each case. In 28 cases only one infective focus was suggested by the pathogen selective method from the several specimens examined in each case. In 72 cases more than one focus was apparently responsible for some proportion of the infection. Taking all the cases together, the clinical importance of infective foci was shown to be in the following order: post-nasal and accessory sinuses first, then intestinal, tonsillar, and dental foci. As regards the actual infective organisms, the streptococcal group was markedly predominant, but practically any other commonly present organisms may be important in an individual case. It is apparently possible to determine which or how many of various suspicious foci in any patient are infectious and which are not, and thereby radical or conservative treatment may be clearly indicated in any case.

V. Coates⁷ (Bath) describes the *tissue reaction* in disorders of the rheumatic group, and with particular reference to subcutaneous nodules. This paper is submitted as another link in the chain of evidence which is tending to establish the relation of orthodox rheumatic infection to multiple infective arthritis of unknown origin. This relationship is thought to be such that both these disorders are but varied expressions of the same disease; circumstance, organ inferiority, and immunity deciding the site of election and the exuberance of the reaction. The classical description of rheumatic nodules we owe to Barlow and Warner,⁸ who stated, "Such nodules belong strictly to the fibrous tissues, and in nature are probably homologous with the inflammatory exudate which forms the basis of a vegetation on a cardiac valve". Hawthorne⁹ formed the opinion that these nodules "did occur in a distinct proportion of cases of rheumatoid arthritis non-sequential to acute or subacute articular rheumatism"; that they could not be distinguished from the nodules of orthodox rheumatic infection, but that their mere presence did not prove a rheumatic condition. In 1926 Coates and C. F. Coombs¹⁰ examined sections cut from nodules removed from cases of infective arthritis, and considered them histologically identical

with those of orthodox rheumatic infection. Coates¹¹ further noted the presence in infective arthritis of the same millet-seed granules as he had previously described in rheumatic children.

L. T. Swaim¹² (Boston) has made further metabolism studies in chronic arthritis. The *metabolic rates* in 312 cases of chronic arthritis, of all types, duration, and activity, show that 39 per cent were abnormal, ± 10 being used as normal. The figures showed the tendency to low metabolic rates in chronic arthritis irrespective of the type of arthritis present. Small doses of **Thyroid** were found to be beneficial, although in a large majority the metabolic rate was uninfluenced.

A. A. Fletcher and D. Graham¹³ (Toronto) examined the *large bowel* in a series of sixty cases of chronic arthritis by X rays following a barium enema. They believe that the abnormalities observed in the colon in arthritis are manifestations of malnutrition. Malnutrition frequently plays a part in the development and course of chronic arthritis. The abnormalities found in the colon are markedly improved by **Dietetic Treatment** with coincident improvement in the arthritis.

TREATMENT.—P. G. Potenciano¹⁴ (Eloise, Mich.), in a comparative study of moniodocinchophen, cinchophen, and the salicylates in the treatment of arthritis, found **Moniodocinchophen** to be the most effective. The drug was given by the mouth in doses of $7\frac{1}{2}$ gr. three times a day. The marked relief of pain, reduction of swelling, and restoration of motion, together with the systemic changes observed, are apparently due to the presence of iodine in the cinchophen molecule.

O. B. Bode and M. Scholtz¹⁵ (London) record good results in the treatment of chronic rheumatic diseases with **Transcutan Baths**. The preparation which is added to the water consists of inorganic salts and essential oils and is in two strengths. The first one or two baths should begin with the first strength. Indications for treatment are: neuritis, especially sciatica, muscular rheumatism (fibrositis), subacute polyarthritis (septic foci should, of course, be dealt with), gout, osteo-arthritis without gross deformities, and joint destructions. Diseases of the skin and disturbances of the circulatory system are contraindications. The method is simple and can safely be carried out at home under medical supervision.

J. E. Harbinson¹⁶ (Woodland, Cal.) reports on the use of **Ammonium Orthoiodoxy-benzoate**. A. G. Young and J. B. Youmans¹⁷ in 1926 were the first to report the use of this drug in the treatment of arthritis. Subsequent investigators have reported over five hundred cases so treated. The drug has an oxidizing and germicidal action. The regular dose was 1 gm. of the substance dissolved in 100 c.c. of sterile physiological saline warmed to body temperature. A preliminary injection of 0.5 gm. was always given to determine any hypersensitiveness or idiosyncrasy to the drug. The intravenous method was used, and injections were usually given every three days, and must be given *slowly*. Six or eight injections constituted a course of treatment, repeated in some cases after an interval of two weeks. No trouble was experienced with thrombosis, and the vein was always washed out with normal saline afterwards. It is suggested that the use of the drug should be limited to those patients whose joint pathology is such that there is a reasonable possibility of improvement in function. The elimination of foci of infection, diet, physiotherapy, and special treatment instituted toward improving the patient's general physical condition are important factors in treatment.

D. W. Baird, J. H. Fitzgibbon, and A. S. Rosenfeld¹⁸ (Portland, Ore.) report the death of one patient and the very serious illness of three others following the intravenous use of ammonium orthoiodoxy-benzoate. Their clinical

experience with these four simultaneous reactions speaks against the assumption that an individual idiosyncrasy either to iodine or salicylates is probable. Furthermore, animal experimentation with two different preparations showed a difference in toxicity. The technique of administration was identical in each instance. It has been suggested, and is, in their opinion, quite likely, that in manufacture, administration, or decomposition of the drug in the blood-stream there was set free an intermediary toxic product which was responsible for the injurious effects observed. The fatality appeared to have been the result of an overwhelming toxæmia. Dosage, care in preparation of the solution, technique, etc., were all those recommended and described in previous numbers of the MEDICAL ANNUAL.

F. G. Thomson¹⁰ (Bath) describes the indications for **Treatment at Bath**. A knowledge of the main principles of spa treatment is now an absolute necessity, as is also an acquaintance with the peculiar features of each spa. The patient's morale is often depressed, and nothing is more encouraging at the commencement of spa treatment than to find the opinion of his practitioner confirmed, whilst this of course very largely influences the success of any after-treatment. This paper very clearly illustrates the particular virtues of spa treatment at Bath, and should be carefully studied. Owing to the mildness of the climate in winter and early spring, Bath is very suitable as a health resort throughout the year. The contra-indications to treatment at Bath are also shown and should be noted, so as to avoid the depressing effect of an unsuitable choice of a spa.

REFERENCES.—¹*Lancet*, 1930, i, 607; ²*Ibid.* 733; ³*Amer. Jour. Med. Sci.* 1929, Nov., 593; ⁴*Practitioner*, 1930, March, 257; ⁵*Proc. Roy. Soc. Med.* 1930, Feb., 339; ⁶*Brit. Med. Jour.* 1929, ii, 43; ⁷*Proc. Roy. Soc. Med.* 1930, March, 587; ⁸*Trans. Fourth Internat. Med. Congress, London*, 1881, 116; ⁹*Rheumatism, Rheumatoid Arthritis and Subcutaneous Nodules*, 1900; ¹⁰*Arch. of Dis. Child.* 1926, Aug., 183; ¹¹*Trans. Bath Conf.* 1925, 181; ¹²*Jour. Amer. Med. Assoc.* 1929, July 27, 259; ¹³*Amer. Jour. Med. Sci.* 1930, Jan., 91; ¹⁴*Med. Jour. and Record*, 1930, Feb. 19, 215; ¹⁵*Lancet*, 1930, i, 1289; ¹⁶*California and West. Med.* 1929, July, 24; ¹⁷*Jour. Amer. Med. Assoc.* 1926, Sept. 4, 746; Section on Pract. of Med. A.M.A. 1926, 192; ¹⁸*Amer. Jour. Med. Sci.* 1930, June, 794; ¹⁹*Practitioner*, 1930, June, 638.

RHINOSPORIDOSIS. (See NOSE, DISEASES OF.)

RICKETS. (See also RENAL RICKETS.) *Reginald Miller, M.D., F.R.C.P.*

There are now so many methods at the disposal of the physician which can be relied upon to cure rickets that it becomes a matter of difficulty to select the most favourable and quickest in any individual case.

Reports on the curative use of **Irradiated Milk** continue to be very favourable. C. Watson, T. T. Finlay, and J. B. King¹ conclude that this method of treatment is quite successful, but that the irradiated milk should not be regarded as a complete substitute for good fresh untreated milk. They have used it in cases of rickets between 2 and 5 years of age in dilutions of 1 to 2 or 1 to 1 with untreated milk, and they regard this method as more rapid, effective, and economical than the use of various irradiated commercial preparations. They also find that the process of irradiation diminishes the bacterial content of the milk very materially. This last point was also found to be true by D. Nabarro and J. O. Hickman,² who regard irradiated milk as possessing about nine times the antirachitic potency of the best untreated milk. A. F. Hess, J. M. Lewis, and H. Rivin³ regard **Irradiated Ergosterol** as a preparation of great potency, and have endeavoured to establish a standard product of which the curative dose would be 10 to 20 drops daily. Such a preparation would have a potency about a hundred times that of a high-grade standard cod-liver oil. They urge that there is a great need for the standardization of these commercial articles.

The curative action of **Irradiated Yeast** has been studied by S. K. Kon and M. Mayzner,¹ and they conclude that a daily dose of 0.75 grm. brings about the disappearance of rickets in infants in about six to eight weeks.

O. Macrae² has attempted to make a strict comparison between the curative results obtained by direct **Irradiation of the Skin**, by administration of **Radiostol**, of **Vigantol**, and of **Cod-liver Oil**. The special value of her observations lies in the fact that the progress and cure of each case was judged by radiological and chemical tests, and that each case was as far as possible put under similar conditions for the period of the observation. Her results are therefore as closely comparable as can obtain in an imperfect world. In the end she found that each method cured quite successfully and with no failure; that the improvement was slowest in the group treated by radiostol; and that in the other three groups healing was equally rapid as judged radiologically and from estimations of the serum calcium and phosphorus. On economic grounds the cure of rickets by irradiation of the child involves expenditure on the apparatus and the frequent attendance of the child, and therefore is more costly in time and money than is a method involving the administration of a remedy by mouth. The cost of cod-liver oil is considerably less than that of irradiated preparations, and therefore in hospitals and welfare centres this is the method of selection. An oil of proved antirachitic properties must, however, be chosen.

REFERENCES.—¹*Lancet*, 1929, ii, 704; ²*Ibid.* 1930, i, 127; ³*Jour. Amer. Med. Assoc.* 1929, xciii, 661; ⁴*Lancet*, 1930, i, 794; ⁵*Arch. of Dis. Child.* 1930, v, 431.

RINGWORM. (See SKIN, FUNGUS INFECTIONS OF.)

RUBELLA.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—K. Stolte¹ reports four cases in which more or less *profuse sweating* occurred from thirty-six to forty-eight hours before the eruption. He suggests that this symptom is much more frequent than is generally supposed and may even be a constant phenomenon.

Cases of rubella complicated by *meningo-encephalitis* are reported by J. H. E. Brock² in a woman of 23 who developed it as the rash was fading, and by R. Debré, R. Turquety, and R. Broca³ in boys of 7 and 8 respectively two days after the appearance of the eruption. All made a complete recovery. Only one other example of encephalitis in rubella is on record—that published by Labougle in a soldier in 1910.

A. Epstein and Loup⁴ report the case of a man, age 25, who a few days after the onset of rubella developed symptoms of *meningo-myelitis* characterized by paralysis of the lower limbs and vesical sphincter, with diminution or abolition of the reflexes and bilateral Babinski's sign, as well as nuchal rigidity and spinal lymphocytosis. The symptoms began to suggest Landry's paralysis, when improvement suddenly occurred and rapid recovery took place.

REFERENCES.—¹*Monats. f. Kinderheilk.* 1929, xlv, 206; ²*Lancet*, 1929, ii, 1190; ³*Presse méd.* 1930, 348; ⁴*Rev. méd. de la Suisse Rom.* 1930, March 10, 161.

RUMINATION (Merycism).

Robert Hutchison, M.D., F.R.C.P.

Rumination is an ability to regurgitate a hastily eaten meal in large mouthfuls, to resalivate the food, chew it again, and reswallow it. It usually begins fifteen to thirty minutes after the meal, lasts from a half to one hour, and occurs fifteen to twenty times within this period. It stops automatically when food begins to taste sour. It is rare in adults but commoner in infancy (see MEDICAL ANNUAL, 1930, p. 288), and may be hereditary. C. F. Long¹ has had the opportunity of examining two persons with the fluoroscope whilst

they were ruminating. His conclusions are: (1) Pressure changes in the thorax seemed to play no part; (2) During the rumination the stomach empties itself by a diminution in size in all diameters, which is probably an expression of both the tightening of the abdominal muscles and the squeezing contraction of the gastric musculature; (3) The bolus is delivered to the mouth by rhythmic strong contractions of the lower portion of the œsophagus, which are squeezing in type; (4) No evidence of organic or functional hour-glass stomach or cascade stomach was noted.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1929, Dec., 814.

SALIVARY-GLAND INFECTIONS, POST-OPERATIVE. (See PRE- AND POST-OPERATIVE TREATMENT.)

SCARLET FEVER. (See also INFECTION FROM BOOKS; PUERPERIUM, DISORDERS OF; TONSILS, DISEASES OF.) *J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—The much greater severity of scarlet fever in Roumania than in Great Britain and the United States is shown by A. Dimitru,¹ who states that of 4109 cases admitted to the Children's Hospital at Bucharest during the period 1918-28, 328 were fatal—a mortality of 7.98 per cent, the death-rate ranging from 27.9 per cent in the first twelve months of life to 2.75 per cent after twenty years. [In the Metropolitan Asylums Board Hospitals during the same period the case mortality has never exceeded 1.8 per cent, and since 1926 inclusive has been under 1 per cent.—J. D. R.]

E. Onetto² reports a severe epidemic which occurred during 1928 in Chili, when the principal foci of disease were Santiago, Valparaíso, Colchagua, and Talca. The total mortality was 6.6 per cent, while in some maternity hospitals very severe forms occurred with a mortality of 25 per cent.

ETIOLOGY.—From comparative observations and experiments with the soluble toxins produced by scarlet fever and erysipelas hæmolytic streptococci, G. F. Dick and G. H. Dick³ came to the following conclusions: (1) No direct relation was demonstrated between spontaneous immunity to scarlet fever and spontaneous immunity to erysipelas toxin; (2) An attack of scarlet fever does not confer immunity to erysipelas; (3) Artificial immunization with scarlet fever toxin produces immunity to scarlet fever without conferring immunity to erysipelas toxin; (4) Erysipelas streptococci yield considerably weaker toxin than scarlet fever streptococci; (5) Erysipelas antitoxin produced by immunizing against toxin from a single strain of erysipelas streptococci neutralizes the homologous toxin and toxins from other strains of erysipelas streptococci, but does not neutralize scarlet fever toxins; (6) Scarlet fever antitoxin obtained by immunizing a horse with toxin from one strain of scarlet fever streptococcus neutralizes the homologous and other scarlet fever toxins, but does not show any cross-neutralization with erysipelas toxins; (7) The soluble toxins produced by scarlet fever and erysipelas hæmolytic streptococci are immunologically specific and distinct.

Ruth Tunnickliff's⁴ observations indicate that the streptococci from scarlet fever, erysipelas, and septic sore throat are distinct organisms, as she found that hæmolytic streptococci from typical cases of erysipelas produced a bright green or chocolate agar after twenty-four to forty-eight hours' growth, while those from scarlet fever caused no change, or occasionally a slight greening of the medium after several days' growth.

A. H. G. Burton and A. R. Balmains⁵ found that 191, or 75 per cent, out of 265 cases of scarlet fever on admission to hospital showed hæmolytic streptococci in the fauces. Of these, 46.1 per cent could be classified under one of Griffith's four groups (of which Types 1 and 3 cause severe attacks, and 2 and

4 mild attacks), the remaining 53.9 per cent being inagglutinable with the type sera. Certain of these strains became agglutinable on repeated subculture. In view of the large percentage of inagglutinable hæmolytic streptococci, Burton and Balmain regard it as impossible accurately to correlate the type of streptococcus with the clinical type of scarlet fever. In 24 complications a hæmolytic streptococcus was found both in the fauces and at the site of the complication; in 10 cases the type was different in the latter from that in the former, which appeared to indicate cross-infection with a different type of streptococcus.

Y. Masuda,⁶ from examination of thirteen children with scarlet fever, found that the earliest date for hæmolytic streptococci to disappear from the throat was the tenth day of disease, and the latest the thirty-seventh day, the average date being the twenty-second day.

SYMPTOMS AND COMPLICATIONS.—According to P. Baize and M. Mayer,⁷ who report six cases in women aged from 17 to 39, all but one of whom were primiparæ, the etiological features of *puerperal scarlet fever* are as follows: Two-thirds of the cases occur in primiparæ. In most cases the source of infection cannot be detected. In the great majority the disease sets in on the third to the fifth day after delivery. The symptoms differ but slightly from those of ordinary scarlet fever. The severity of the attack varies in different epidemics. As a rule the prognosis is likely to be severe when the interval between delivery and the onset of symptoms is short. As regards the pathogenesis, two groups of puerperal scarlet fever may be distinguished: the first consists of cases of ordinary scarlet fever which has developed as a mere coincidence in the puerperium, while in the second and much larger group the attack has resulted from an endometritis which is usually slight. These two groups can be distinguished from puerperal scarlatiniform erythema by the Schultz-Charlton reaction.

DICK TEST.—L. Hirsfeld⁸ states that between the years 1924 and 1926 18,789 persons were Dick-tested at the State Institute of Hygiene in Warsaw, the proportion of positive cases ranging from 27.6 per cent in recruits to 88 per cent in an out-patient department, and from 90.3 per cent in the age-period 1 to 2 years to 29.2 per cent at the age of 21. He also found that when both parents gave a positive reaction, their children also were positive; and that when the parents' reaction was negative, somewhat over a third of the children were positive; while if one of the parents was positive and the other negative, about two-thirds of the children were positive. Examination of the Dick reaction after active immunization showed that the children of the proletariat at Warsaw were easier to immunize than those of the middle classes, as had also been found by American observers.

PROPHYLAXIS.—Commenting on the recent paper by Seligmann (*see MEDICAL ANNUAL*, 1930, p. 454), who discredits the value of their method of swabbing scarlet fever patients before discharge from hospital, U. Friedemann and H. Deicher⁹ make the following reply: (1) Seligmann's statistics are of no value because only a single bacteriological examination was made in each case. (2) A negative result may be due to rapid disappearance of streptococci from the swabs. Throat swabs, therefore, should be examined on the day on which they are taken, and nasal swabs should be examined as well.

On the other hand, O. Klingberg,¹⁰ E. A. Lane and E. A. Beckler,¹¹ and H. Happe and H. Thiele¹² do not regard the presence of hæmolytic streptococci in the throat as any objection to the patient's discharge from hospital or return to school. [The reviewer cordially agrees with the opinion expressed by Lane and Beckler, that until a technique is available that is sufficiently precise to identify the scarlet fever organism as well as sufficiently simple for general

application, the control of scarlet fever must continue without the aid of throat cultures.—J. D. R.]

T. Radoyé¹³ performed the Dick test on 1367 young soldiers and officers' children: 725 who gave a positive reaction were immunized by four to six subcutaneous injections of toxin, of which a total of from 3000 to 4000 skin-test doses were given, with the result that during the next three years not a case of scarlet fever occurred in the community in which it had hitherto been endemic.

Encouraged by the results of Ramon and Zoeller (*see* MEDICAL ANNUAL, 1929, p. 426) Sikostitch-Yoksitch¹⁴ inoculated 32 Dick-positive children aged from 6 to 17 years by the nasal route, instilling two drops of Dick toxin into the nostrils twice daily for seven days in succession. Fourteen days later the Dick test was performed and proved negative in all. No local or general reaction resulted, and control inoculation by subcutaneous injections showed that immunity was obtained more slowly thereby than by the nasal route.

According to F. Redlich,¹⁵ who reviews the literature and records his own observations in Poland, active immunization against scarlet fever has not fulfilled the expectations of the profession, and statistics as to its efficacy are far from convincing, while passive immunization by scarlatinal antitoxin makes a positive Dick reaction negative in only a small proportion of cases, and epidemiological investigations as to the efficacy of this method are very scanty.

F. M. Meader¹⁶ injected 450 scarlet fever contacts with 7.5 c.c. each of the pooled serum from donors who had had scarlet fever within a year or a little earlier. The injections were made within six months of the time that the serum had been taken from the donors. Subsequently only 2.9 per cent of the injected contacts contracted scarlet fever as compared with 12.8 per cent of controls who had not received the serum. The immunity lasted only three or four weeks. According to Meader this method is of special value in checking outbreaks of scarlet fever in hospitals and other institutions.

TREATMENT.—According to Burton and Balmain⁵ the results of routine treatment of cases of scarlet fever with **Antitoxin** are good, but do not compare with those obtained by the use of antitoxin in diphtheria. They do not agree with Toomey and Dolch that the serum sickness is usually more severe than the disease itself, as a serum rash which caused very little inconvenience occurred in only 24.5 per cent of their cases and no other symptoms of serum sickness were observed. Burton and Balmain maintain that the serum markedly reduces the number of toxic complications and less markedly the number of septic complications, but does not delay the onset of complications.

J. D. Rolleston¹⁷ reports his observations on 450 cases of scarlet fever treated by antitoxin. In 214 the benefit was immediate and dramatic, as shown by improvement of the general condition, fall of temperature to normal within twenty-four hours, and rapid disappearance of the eruption, though as a rule the constitutional change took place some time before the rash had faded. In 200 cases the improvement, though definite, was less sudden and pronounced, while in 36 no benefit of any kind resulted. The serum was almost always injected intramuscularly, and only in a few very severe cases intravenously. Repeated injections were required much less frequently than in the case of diphtheria, as only 21 of the 450 cases had two injections and 3 three injections. The doses were usually 30 to 40 c.c. irrespective of the age of the patient, which ranged from 1 to 51 years. Serum rashes, which were observed in 202 cases (44.8 per cent), were, with the exception of one case with circinate erythema, urticarial, and were either localized to the site of injection or more or less generalized. As a rule the eruption was not accompanied by any rise of temperature or constitutional disturbance. Like most observers, Rolleston holds that the chief value of the serum treatment of scarlet fever lies in its

power to alleviate the toxic symptoms of the acute stage, while it has little or no action in preventing or curing complications.

From observations on 420 cases of scarlet fever, half of which were given antitoxin and half received symptomatic treatment only, E. Gabriel¹⁸ comes to the conclusion that the value of scarlet fever antitoxin cannot be really determined until it has been tested in a severe epidemic. In the meantime, while the disease is relatively mild, he suggests that further comparative observations should be made, as in a really serious outbreak it would be undesirable to refrain from injecting severe cases.

A. Stroë and D. Hortopan¹⁹ state that the results obtained at the Children's Hospital, Bucharest, by the use of **Convalescent Serum** in the treatment of severe and malignant cases were better than those with scarlet fever antitoxin.

REFERENCES.—¹*Spitalul*. 1929, 300; ²*Rev. med. cir. do Brasil*, 1929, 330; ³*Jour. Amer. Med. Assoc.* 1929, xciii, 1785; ⁴*Ibid.* 1930, xciv, 1213; ⁵*Lancet*, 1929, ii, 545; ⁶*Oriental Jour. Dis. Child.* 1929, 23; ⁷*Presse méd.* 1929, 1007; ⁸*Seuchenbekämpfung*, 1929, vi, 168, 215; ⁹*Deut. med. Woch.* 1929, Sept. 6, 1496; ¹⁰*Münch. med. Woch.* 1929, Nov. 1, 1833; ¹¹*New Eng. Jour. Med.* 1929, cc, 1283; ¹²*Arch. f. Kinderheilk.* 1929, lxxxviii, 175; ¹³*Rev. d'Hyg.* 1930, April, 249; ¹⁴*Rev. franç. de Pédiat.* 1929, 614; ¹⁵*Seuchenbekämpfung*, 1929, 174; ¹⁶*Jour. Amer. Med. Assoc.* 1930, xciv, 622; ¹⁷*Practitioner*, 1930, cxxv, 236; ¹⁸*Jahrb. f. Kinderheilk.* 1929, cxxv, 1; ¹⁹*Arch. roum. Pathol. exper. et Microbiol.* 1929, Sept., 257.

SCARLET FEVER, MANAGEMENT OF.

G. E. Oates, M.D., M.R.C.P., D.P.H.

During the middle of the last century scarlet fever was one of the scourges of child life, with a case mortality of 30 or 40 per cent. Since 1875 there has been a remarkable drop in its mortality, but the incidence of the disease has not diminished to any great extent. At the present time scarlet fever, although widely prevalent, is comparatively harmless and generally free from complications. In spite of this, we deal with the condition as if it were still a 'dangerous infectious disease', and large sums of money are spent in maintaining isolation hospitals for the prolonged segregation of cases, whilst little is done to provide institutional accommodation for the really dangerous infectious diseases, such as measles and whooping-cough.

There has been a widespread feeling of doubt as to whether the orthodox official attitude is the right one, and the change of policy adopted in the infectious hospitals service of the London County Council is an indication of the direction in which expert opinion is moving. This authority has now decided that in times of measles prevalence the practice of giving preference to cases of scarlet fever shall be abandoned, and that, if necessitated by the number of measles cases admitted, the scarlet fever admissions shall be curtailed, and those patients treated at home who can be properly isolated.

In times of measles prevalence the Medical Officer of Health will decide whether or not a case of scarlet fever can be properly dealt with at home. There is no doubt that many cases are removed to hospitals which could much better be kept at home. The home treatment of this disease calls for a room in which the patient can be isolated with medical and nursing attendance. The doctor must be prepared to supervise the precautions necessary to prevent infection being conveyed outside the sick-room. Home isolation has advantages and disadvantages. A child nursed at home is less likely to get the septic complications of scarlet fever, involving the nose and ear. It also escapes the possibility of a 'relapse' or 'secondary infection' from which a case, if wrongly diagnosed, may suffer after admission to a scarlet fever ward. Against home isolation must be placed the expense of medical attendance and the loneliness and confinement involved. Since the cost to the ratepayers of keeping a scarlet fever patient in hospital may be anything from three

to six pounds a week, it is worth consideration whether Local Authorities should not encourage home isolation in suitable cases by meeting the cost of domiciliary medical treatment.

SCHISTOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

T. Parr¹ has investigated the distribution of schistosomiasis in the Sudan, where *S. hematobium* infections through *Bullinus* snail carriers are the common ones and the disease is of economic importance, with 9.7 per cent of the population of the Dongola Province affected. In the Nuba Mountains the writer found the infection to be widespread, as shown by the frequency of infections in school-children from this area, in whom vesical symptoms predominate. The usual **Tartar Emetic** treatment was effective in most, and **Emetine** in those resistant to antimony. M. Khalil and M. S. El Din² report on the comparative value of different methods of microscopical diagnosis of intestinal schistosomiasis; these included: (1) Smears from the surface of stools; (2) The precipitation method in which an examination is made of the sediment of an emulsion of a stool after passing through a fine sieve and adding a concentrated salt solution, in which ankylostoma ova float but schistosome ones sink; (3) Fulleborn's method of repeated washing of 1 cm. of a stool emulsified in 2.5 per cent salt with sedimentation in the dark, followed by pouring warm distilled water on the sediment in bright light to enable the escaping miracidia to be seen with a hand lens; and (4) Khalil's own plan of examining mucus obtained from the rectum by lightly scraping the mucous membrane with a finger covered with a rubber glove and soap. The latter proved effective in 93 per cent of 54 cases, the precipitation method in 79 per cent, and smears in 70 per cent. H. C. Sinderson³ has found that in the very sunny climate of Iraq almost 20 per cent of *S. hematobium* infections show a butterfly-like pigmentation of the cheeks and nose that is of diagnostic import; this he attributes to the action of a toxin in the areas exposed to bright sunlight. R. Girges⁴ has published a detailed account on general lines of schistosomiasis as seen in Egypt.

TREATMENT.—M. Khalil and M. H. Betache⁵ record good results from the treatment of bilharziasis with a new trivalent organic antimony compound called '**Fouadin**', an antimony-III-pyro-catechin-disulphonate of sodium in the form of a white powder containing 13.5 per cent of antimony; "fouadin is a solution 0.0055 grm. of Sb in 1 c.c." A course of nine intramuscular injections in the gluteal region of 1.3 and 3.5 c.c. on the first two days and 0.5 c.c. on alternate days subsequently proved successful in the majority of cases, and by means of a two-way-tap syringe connected with a reservoir 200 cases could be injected per hour with the aid of a large number of needles, which are boiled between each injection. Little pain or toxæmia is produced, and a comparative trial of this and tartar emetic on 1000 cases showed apparent cure of 68.6 per cent with fouadin and 43.2 per cent with tartar emetic; later results in 83 cases re-examined after one to three months showed 97.6 per cent cured by the new preparation, while the duration of treatment has been reduced from twenty-nine to nineteen days with a simpler method of administration and less danger of abscess formation or inflammatory complications. The cost of the new drug is not mentioned. G. C. Shattuck⁶ reports the use of **Antimony Thioglycollamide** in 14 cases of schistosoma *hematobium* with apparent cure in 12 after an average of four doses totalling from 0.11 to 0.46 grm.

REFERENCES.—¹*Jour. R.A.M.C.*, 1930, April, 261; ²*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, March, 519; ³*Ibid.*, April, 633; ⁴*Jour. Trop. Med. and Hygiene*, 1929, xxxii, 269; 1930, xxxiii, 1, 49, and 65; ⁵*Lancet*, 1930, i, 234; ⁶*Jour. Trop. Med. and Hygiene*, 1930, xxxiii, 33.

SCHIZOPHRENIA. (*See DEMENTIA PRÆCOX.*)

SCROTUM, DISEASES OF. (*See TESTICLE AND SCROTUM, DISEASES OF.*)

SEMINAL VESICLES, SURGERY OF.

Sir John Thomson-Walker, F.R.C.S.

R. Gutierrez¹ reports a series of cases subjected to seminal vesiculectomy by the perineal method of approach, for the elimination of septic foci in insane patients at the New Jersey State Hospital during the years 1923 and 1924. In 98 cases where this was performed, both vesicles were removed; in one case vesiculectomy was done, and in another prostatotomy. All the patients had had a complete physical and laboratory examination, followed by the removal of all other possible foci of infection, before being subjected to a genito-urinary examination. Thus, infected teeth, chronic tonsillitis, chronic otitis media, and chronic inflammation of the paranasal sinuses were treated where found, and serological and bacteriological tests and X-ray examinations made. The writer states that, therefore, in the clinical results obtained in this series of mental cases, vesiculectomy must be considered as only one factor contributing to the alleviation or cure of the mental condition. There was no operative mortality, but 2 patients subsequently died of pulmonary tuberculosis, 2 of pneumonia, 2 committed suicide by hanging, 1 died of nephritis, and 1 of cardio-renal insufficiency. A diagnosis of chronic vesiculitis was made in all as the result of the genito-urinary investigation. The clinical diagnoses of the mental condition of these patients were: dementia præcox 56, paranoia 14, manic-depressive insanity 13, alcoholic hallucinations 4, mental deficiency 3, neurasthenia 2, epilepsy 1, paresis 1, toxic psychosis 2, constitutional inferiority 1, alcoholic imbecility 1, and there were 2 cases unclassified. Details of the operative technique are described, and the results may be summarized as follows: 48 were improved and some of these were even regarded as cured; 27 showed no improvement; in 17 there is no post-operative record; and 8 died.

A. L. Wolbarst² considers that the most satisfactory treatment of chronically infected seminal vesicles can be achieved by **Vasotomy** and the injection of antiseptics into the vesicular cavity. This should be done early—as soon, in fact, as it becomes apparent that routine treatment by means of vesicular massage with the finger in the rectum, and irrigation, are not meeting the needs of the situation.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1929, Dec. 21, 1944; ²*Med. Jour. and Record*, 1929, Dec. 18, 673.

SHINGLES. (*See HERPES ZOSTER.*)

SHOCK. (*See PRE- AND POST-OPERATIVE TREATMENT.*)

SINUS THROMBOSIS. (*See EAR, DISEASES OF.*)

SKIN. (*See also, ERYTHEMA; GONORRHOEA; HERPES ZOSTER; LUPUS ERYTHEMATOSUS; LUPUS VULGARIS; NÆVUS; PITYRIASIS FOLLICULORUM; PITYRIASIS LICHENOIDES; ULCERS; XANTHOMA.*)

SKIN, DISCOLORATION OF. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

Due to Mercury.—L. Hollander and H. C. Baer¹ report the case of a woman who developed a dirty greyish-black pigmentation of the face, neck, and upper chest. The pigmentation was sharply demarcated. She had been massaging on a cream, 'Dermatone', for fifteen years, and for the last four years had followed the massage with exposures to infra-red rays. Suspecting metallic

discoloration, the authors found mercury in the cream, and by the electro-micro-qualitative method Professor Silverman was able to demonstrate the presence of mercury in the skin. The authors attempted to dislodge the mercurial deposit by local treatment. They rubbed in **Tincture of Iodine** to form a soluble mercuric iodide, and then followed this with the application of **Alcohol**, to dissolve this compound. Noticeable improvement followed, but the patient disappeared before cure was complete.

Due to Use of Perfume.—P. Gross and L. B. Robinson² report five cases of a curious pigmentation of the skin, described originally by Freund in 1916, later named *Berlock dermatitis* by Rosenthal. The pigmentation, which is patchy, appears to be produced by exposure to strong sunlight after the application of certain perfumes such as eau-de-Cologne or bergamot oil. In Gross and Robinson's cases no eau-de-Cologne had been used, but certain perfumes which they designate G.M. and G.S.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1929, July, 27; ²*Ibid.* 1930, April, 637.

SKIN DISEASES, BLOOD CHEMISTRY IN.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Blood Nitrogen.—J. F. Schamberg and H. Brown¹ report observations on the non-protein nitrogen, urea nitrogen, and uric acid in the blood of 875 patients suffering from skin diseases. Of these, 455 were cases designated as eczema. They find that age exerts a distinct influence on the average nitrogenous content of the blood. From the third to the eighth decade there is a distinct and steady rise of non-protein nitrogen, urea nitrogen, and particularly uric acid. Males exhibit more of these substances in the blood than females. In eczema and in pruritus, particularly of the generalized type, the authors found a perceptibly higher percentage of patients with an excess of non-protein nitrogen, urea nitrogen, and uric acid than in other dermatoses. They conclude that a study of the blood chemistry of patients suffering from refractory dermatoses is of material aid in prescribing appropriate dietaries.

Blood Chlorides.—N. Burgess² has estimated the blood chlorides in 35 persons, 5 of whom were apparently normal, 20 were suffering from eczema, and 10 from other dermatoses. He finds that the blood chlorides in eczema of all types, including infantile eczema, as well as in cases of acne, pruritus, and pemphigus tested by him, were within normal limits. He therefore concludes that there is no indication for attempting to reduce the chloride content of the blood in the treatment of patients with these diseases.

Blood Sugar.—A. R. Somerford³ has made an examination of the sugar tolerance in 120 cases of various dermatoses. Only 23.3 per cent of these cases gave normal results. He finds that the tolerance curve rises highest in cases of the lichen group and in those of pruritus. In 40 cases of eczema the curve only rose a little above the normal, but there was some delayed lysis. In 20 cases of diseases of the pilo-sebaceous follicles, such as acne vulgaris and coccogenic sycoosis, there was practically no abnormality, the author's observations thus differing from those of Highman, Schwartz, and Mahnken. In order to find out whether pruritic cases differed in their blood-sugar tolerance from similar conditions unassociated with pruritus, he took 14 cases of chronic psoriasis, 8 of which were associated with pruritus and 6 were free from itching. The former showed a definite rise in the curve with delayed lysis, while the latter showed practically normal curves. A somewhat similar result was obtained in the eczema group. The author considers the results support the views of McGlasson, who found a hyperglycemia associated with pruritus.

Blood Calcium.—H. Brown and S. S. Greenbaum⁴ have made further observations on the work published by Greenbaum and reported in the *MEDICAL ANNUAL*, 1929, p. 515. This work had been questioned by N. Burgess,⁵ who found a marked diminution in precipitable serum calcium in the vast majority of cases of urticaria which he studied. The authors have failed to confirm Burgess's results, and find that the total serum calcium is normal in urticaria.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1930, Jan., 1; ²*Ibid.* 1929, July, 59; ³*Lancet*, 1929, ii, 1140; ⁴*Brit. Jour. Dermatol. and Syph.* 1930, April, 183; ⁵*Ibid.* 1928, July, 279.

SKIN, FUNGOUS INFECTIONS OF. (See also COCCIDIOIDAL GRANULOMA.)

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Ringworm of the Feet.—That interdigital ringworm of the feet is on the increase is a fact which has been patent for some time. Its prevalence in public schools and colleges in this country has been a matter of much concern to those responsible for the health of schoolboys and students. This state of affairs exists in other countries, and an interesting study has been made of the occurrence of this trouble among the students at the University of California by R. T. Legge, L. Bonar, and H. J. Templeton.¹ In the session 1928-9 among 3100 fresh entrants 53.3 per cent of the men and 15.3 per cent of the women showed the disease. At the end of the spring term another survey was made of 1000 men and 997 women who had been engaged for two terms in physical education and who had the entrée to the shower-baths, swimming-pools, and gymnastic apparatus. It was found that 78.6 per cent of the men and 17.3 per cent of the women students had clinical manifestations of ringworm of the feet. Among the men 9.3 per cent also had groin ringworm. This constitutes an increase of 25.3 per cent in the case of the men and only 2 per cent in the case of the women. The authors then point out that the women's gymnasium is new and equipped with every sanitary device. Women students and attendants are obliged to provide and wear rubber bathing-shoes, and under no circumstances are they permitted to walk with bare feet on the floors of the showers or runways leading to the swimming-pools or gymnasiums. On the other hand, the men occupy an antiquated gymnasium, where, on account of lack or non-use of bathing-shoes and inferior sanitary facilities, the students constantly walk in their bare feet and become infected. They believe that this single factor has been an important one in controlling the infection, and stress the point that no one should be permitted to touch with bare feet the floor of any gymnasium, athletic club, shower-bath, or runway to swimming-pools.

Infection of the Nails in Foot Ringworm.—C. M. Williams and E. A. Barthel² have examined scrapings from the nails in a series of forty cases of foot ringworm, and found fungus of the ringworm group in the toenails. The abnormality in the nails was so slight that the patients were seldom aware of it. The infection persisted in the nails long after all cutaneous symptoms had disappeared. Cases of this type had been reported previously by Hodges and by Semon. The condition probably accounts for many of the recurrences of foot ringworm after treatment.

Trichophytides.—The occurrence of eruptions due to the dissemination by the blood of the fungus or toxins of ringworm occurring in association with a deep-seated ringworm infection has now been recognized for some years, chiefly through the work of Jadassohn and Bloch. Various types of eruption have been described, some of which have been recorded in previous numbers of the *MEDICAL ANNUAL*. I. Muende³ records a case of conjunctivitis believed by him to be a trichophytic manifestation. It occurred in a case of scalp

ringworm which developed an inflammatory reaction with pustule formation after X-ray treatment. Sixteen days after treatment a severe conjunctivitis developed, associated with an eruption of urticarial lesions with small central pustules. This eruption and the conjunctivitis subsided in about fifteen days, and some eight days later a second eruption which developed the characteristics of a lichen trichophyticus appeared, associated with another area of infiltration and pus formation on the scalp. At this stage there was a strongly positive trichophytin reaction.

Favus.—J. G. Tomkinson¹ reports a case of favus on the penis and scrotum. The lesions showed the characteristic yellow scutula. The fungus present was the *Achonion quinckeanum*. The lesions cleared up under **Salicylic Acid** and **Ammoniated Mercury Ointment**.

Thallium Treatment of Ringworm of the Scalp.—G. H. Percival² has made a study of cases treated with thallium acetate with a view to determining the method of action of the drug. The subject is very fully discussed, and the author finds that there is no direct evidence to show that the drug acts indirectly through the endocrine-sympathetic system; what evidence is available is rather against this view. There is also no conclusive evidence in favour of the direct action of the drug on the cells of the hair; but in view of the similarity of the action of X rays, which almost certainly act in this way, and the fact that Sabouraud has found repeated inunction of an ointment of thallium acetate will cause local atrophy of the hair, the author appears to favour the latter view.

Yeast-like Infections of the Skin.—Attention was drawn in the MEDICAL ANNUAL of 1927 (p. 452) to a paper by B. Shelmire describing, under the title of "Thrush Infection of the Skin", a number of affections produced by the *Oidium albicans*. In the 1929 volume (p. 119) a summary was given of the work of MacLeod and Dowling on their study of the '*Pityrosporon of Melassez*', as a cause of seborrhœic dermatitis. J. M. H. MacLeod³ and G. B. Dowling⁷ have made further contributions to the subject of these yeast-like infections of the skin. These authors point out that none of the organisms which produce these lesions are true yeasts (Saccharomyces), which reproduce by the formation of asci, but belong to a lower group of fungi, the Thallophytæ (or Thallosporales, as Castellani calls them). It has not been shown that true yeasts are pathogenic in man. As regards the 'thrush' infections, it is probable that these are not all due to one species but to several which belong to the family of Oösporaceæ and the genus *Monilia*. The *Oidium albicans* is now generally designated *Monilia albicans*, and other common pathogenic monilia are the *M. pinoyi* and the *M. candida*. Closely related are the family of *Cryptococcaceæ*, among the species of which is the *Cryptococcus hominis*, the organism described by Gilchrist and Stokes in human blastomycosis. One fungus more nearly related to the true yeasts, namely the *Coccidioides immitis* of Rixford and Gilchrist, which belong to the family of Endomycetaceæ, may give rise to lesions closely simulating those of cutaneous blastomycosis; a case of this disease was illustrated by a coloured plate (Plate XXXVI) in the MEDICAL ANNUAL for 1930.

The lesions produced by the monilia have been described by Shelmire (see above), but it is noted that the clinical appearances of certain conditions may be similar whether produced by ringworm fungi or monilia. This is especially the case in interdigital affections of the feet, in vesicular dermatitis of the hands, and in onychomycosis. The '*Pityrosporon of Melassez*', the cultural characteristics of which were described two years ago by MacLeod and Dowling (see above), is closely related to monilia. Dowling brings forward further evidence to prove that it is the causal organism of seborrhœic dermatitis, a

contention which has been denied by Benedek, who has grown an organism, the *Schizo-saccharomyces*, which he claims as responsible, not only for this condition, but also for seborrhoea, some cases of sycosis, certain axillary and pubic abscesses, and some cases of submammary and axillary intertrigo. Dowling, in conjunction with MacLeod, Burford, and Garner, has examined a culture supplied by Benedek and has come to the conclusion that the organism is not a fungus but a sporing bacillus. Moreover, he has failed to produce the typical lesions of seborrhoeic dermatitis with this organism, while he has been able to do this repeatedly with cultures of the 'Pityrosporon of Melassez'.

Blastomycosis.—A. Castellani⁵ has made a further investigation of the fungi producing the condition clinically known as blastomycosis in the North American Continent. As has been pointed out above, two different groups of fungi have been considered responsible for this clinical picture—the cryptococci (of which the *Cryptococcus dermatitidis*, Gilchrist and Stokes, was originally described by these two observers under the name of *Blastomyces dermatitidis*) and the coccidioides (of which *Coccidioides immitis*, Rixford and Gilchrist, has been most frequently isolated). The cryptococci are a lower form of fungus which do not reproduce by ascospores and belong to the class Hyphomycetes, while it has been believed that the coccidioides did reproduce by ascospores and were classified in the class Ascomycetes. Castellani has now re-investigated these fungi and has come to the conclusion that the so-called ascospores in *Coccidioides immitis* were not true ascospores, but that the minute bodies seen were protoplasmic granules. He therefore considers that this fungus should be placed among the Hyphomycetes. A careful investigation has led him to believe that at least four different closely related species of fungus have been found in clinical blastomycosis, and he thinks the time has come to group them together as a separate genus, to which he has given the new name—*Blastomycoïdes*. The four species he has named are: (1) *B. immitis*, Rixford and Gilchrist (formerly *Coccidioides immitis*); (2) *B. dermatitidis*, Gilchrist and Stokes (formerly *Cryptococcus dermatitidis*); (3) *B. tularensis*, Castellani; and (4) *B. lanuginosus*, Castellani, the last two being fungi described by the author in 1926 and 1930 respectively. A full description of their cultural characteristics is given.

Coccidioidal Granuloma.—E. D. Chipman and H. J. Templeton⁶ describe a case of this disease affecting the neck, back, and finger, together with the cervical and axillary glands, in a man of 26 years. There was also involvement of both ilia. The fungus proved to be the *Coccidioides immitis*, which was found in smears of pus obtained by direct cultivation and also from lesions in an inoculated guinea-pig. Coccidioidal granuloma is a disease which is almost entirely found in the St. Joaquin Valley, California, though a few cases have been described elsewhere. This patient had never been in the St. Joaquin Valley, but had worked in a cotton mill which received its cotton from this area. Treatment with injections of antimony potassium tartrate, as recommended by Guy and Jacobs, was tried without result. Injection of colloidal copper and protein shock therapy by means of intravenous injections of typhoid vaccine also had no effect on the disease. The lesions improved about 75 per cent by the administration of **Potassium Iodide** in doses of 12 grm. daily, together with intravenous injections of 10 to 20 c.c. of compound solution of **Iodine** given twice weekly. **Liver Diet** and general **Light Therapy** were also given to treat the secondary anæmia.

Perlèche due to Fungus.—The name perlèche has for long been applied to an affection seen chiefly in children which is characterized by a persistent sodden condition of the mucous membrane at one or both commissures of the lips, often associated with fissuring. The name is derived from the 'mother-

of-pearl' appearance of the mucous membrane seen in this condition. For many years past the affection has been thought to be related to impetigo contagiosa and to be due to an infection with streptococci, the work of Sabouraud, Jadassohn, Cole, J. E. Lane, Haxthausen, and others all pointing in this direction. Recently C. W. Finnerud¹⁰ has had the opportunity of studying an epidemic of this affection which broke out in an orphanage near Chicago; 108 cases occurred, and a special study was made of 100 of these. In 82 of these yeast-like organisms were isolated, which fell into two groups in almost equal proportions, namely *Cryptococcus (sensu lato)*, and *Monilia (sensu lato)*. Finnerud was also able to reproduce the disease in 9 out of 10 children by superficial inoculation of the angles of the mouth with organisms isolated from some of these cases. The author makes no claim that all cases of perlèche are due to this group of fungi, but there would seem to be little doubt that he has shown conclusively that these yeast-like organisms are capable of producing the perlèche type of lesion. Finnerud finds these cases clear up readily if painted with an 8 per cent solution of **Silver Nitrate** every three to seven days, the number of applications required for a cure varying from one to four.

Actinomycosis.—F. Ronchese¹¹ describes a case of actinomycosis limited to the skin, which, as he points out, is of very rare occurrence. The patient was a lad of 15 years of age and otherwise healthy. The lesion was localized to the front and inner aspect of the left ankle and consisted of a mass of purplish-red nodules which were perforated by numerous holes from which serum and pus, mixed with sebaceous and bloody fluid, escaped either spontaneously or by pressure. Cultures from the pus were negative, but inoculation into a guinea-pig produced an abscess, cultures from the pus of which produced a growth which was identified by Professor Pallacci as *Actinomycosis bovis*. No 'sulphur bodies' were found either in the pus from the patient or in that from the guinea-pig. The case indicates the difficulties which may be encountered in the diagnosis of chronic granulomatous lesions. Treatment by iodides and X rays was not successful, and **Excision** was therefore resorted to.

Maduromycosis.—K. L. Prestow¹² publishes a case, which is probably unique, of a 19-year-old girl student who developed a series of lesions described as 'boils', 'deep abscesses', or as 'hard lumps', on her nose, cheek, behind the right ear, and on the extensor surface of the right forearm. These lesions when opened and treated with antiseptic dressings did not heal, but tended to burrow in the skin, forming 'channels'. Eventually the lesions healed, but recurred, this occurring on two occasions. It was then noticed that the pus contained a number of minute black granules, which suggested the possibility of a fungous origin. Culture revealed a fungus which was identified by Dr. Charles Thorn as *Aspergillus nidulans*. The case is of special interest from the fact that the patient had never been in any of the areas in which this disease is usually found, and that it occurred in regions other than the foot, which is its most frequent site. As regards treatment, iodine even in large doses failed to produce any result, as did X-ray treatment. Local excision was also useless, but when the excision was carried wide of the lesions a cure resulted, showing that the disease had extended to a much wider extent below the skin than was suggested by the size of the skin lesions. The author discusses very fully the vexed question of the mycology of maduromycosis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1929, July 20, 170; ²*Ibid.* Sept. 21, 907; ³*Brit. Jour. Dermatol. and Syph.* 1930, Jan., 26; ⁴*Brit. Med. Jour.* 1929, ii, 1194; ⁵*Brit. Jour. Dermatol. and Syph.* 1930, Feb., 55; ⁶*Brit. Med. Jour.* 1930, i, 1119; ⁷*Ibid.* 1929, ii, 947; ⁸*Brit. Jour. Dermatol. and Syph.* 1930, Aug.-Sept., 365; ⁹*Arch. of Dermatol. and Syph.* 1930, Feb., 259; ¹⁰*Ibid.* 1929, Oct., 434; ¹¹*Ibid.* July, 1; ¹²*Ibid.* Nov., 642.

SKIN, PYOGENIC INFECTIONS OF. (*See also* PYOGENIC INFECTIONS; STAPHYLOCOCCAL INFECTIONS. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*)

Sycosis Barbae.—The treatment of this condition is a matter on which dermatologists differ considerably, but many different treatments will produce good results if carried out thoroughly and persisted in. J. T. Ingram¹ adopts the following method: (1) The beard must be shaved daily no matter what the state of the beard area or the stage of the infection. (2) Any infective lesions other than the sycosis—fissures, infections of the vestibule of the nose and of the external auditory meatus, etc.—must be treated and must be cleared up before a cure of the sycosis can be expected. (3) A strongly antiseptic lotion must be applied with a view to eradicating the infection from the follicles; a weak application is not effective. The lotion should be dabbed on and allowed to dry. Wet lint, dressings, masks, etc., should not be employed. The lotion he finds most suitable is the '*Eau d'Alibour*' of the St. Louis Hospital, Paris (copper sulphate 4 gr., zinc sulphate 6 gr., camphor water to the ounce), and at first this may be applied at night only and a lotion or liniment of **Calamine** may be used by day. At no time and at no stage should an ointment be prescribed. **X-ray Treatment** with a view to producing epilation, in Ingram's opinion, is only required in very obstinate cases.

J. A. Scott² uses the following method: (1) The infected follicles are epilated, and pustular lesions evacuated with a needle. (2) The affected parts are washed daily with 10 per cent superfatted sulphur soap. (3) The parts are then mopped with a towel. (4) A solution of 4 gr. of **Iodine** in an ounce of 90 per cent spirit is dabbed over the affected parts with a tampon of cotton-wool and allowed to dry. (5) A lotion consisting of **Sulph. Præcipit.** 1 to 2 drachms, **Spt. Camphor.** 1 drachm, **Lot. Calamin.** to 8 oz. is then applied and allowed to dry. The strength of the sulphur should vary in relation to the degree of inflammation. (6) An ointment consisting of **Zinc Oxide** 15 gr., neutral yellow **Vaseline** 1 oz., is very sparingly applied all over the affected parts. (7) The whole is then dusted over with talc powder. He recommends that the patient should not shave more than twice a week, and before doing so should epilate the infected follicles.

Bacteriophage Treatment.—H. E. Alderson³ has been experimenting with the use of injections of bacteriophages in the treatment of pyogenic infections of the skin. The bacteriophage—discovered by d'Hérelle in 1916—is prepared by suspending approximately 250 million young bacteria in alkaline (pH 7·6) broth and adding a drop of lytic principle known to possess activity for the particular organism. Lysis is complete within twelve to twenty-four hours, when the lysate is passed through a Chamberland L3 candle (to ensure sterility). Ten patients suffering either from furunculosis or acne vulgaris were treated with staphylococcus bacteriophage, a test dose being first administered, and after 1 c.c. and later 2 or 3 c.c. at intervals varying from twenty-four hours to four or five days. Two injections only were given in two cases, the remainder had more. In seven cases the results were encouraging.

REFERENCES.—¹*Brit. Med. Jour.* 1929, ii, 620; ²*Ibid.* 621; ³*Arch. of Dermatol. and Syph.* 1930, Feb., 197.

SKIN SENSITIZATION IN DERMATITIS AND ECZEMA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

The importance of the sensitiveness of the skin to different substances in the etiology of various cases of dermatitis and eczema is not only of dermatological interest, but also of great economic importance.

Occupational Dermatitis.—Bruno Bloch,¹ in a paper read at a meeting of the Royal Institute of Public Health in Zurich, expressed the view that

artificial eczema (occupational dermatitis) was an idiosyncratic disease, and that in the majority of cases this idiosyncrasy was acquired and not present primarily. He shows that the differences which have been thought to exist between allergy and idiosyncrasy are more apparent than real. He has used for some years certain test substances, including iodoform, formalin, turpentine, quicksilver, quinine, and primula leaves, as well as substances used in the individual's trade or occupation, to determine the sensitiveness of the skin in eczematous individuals. He has found that persons subject to eczematous eruptions are about seven times more reactive to these substances than normal persons. He therefore suggests that some such tests should be applied to workers before taking up their occupation, and that any new employee who gave clearly positive reactions should not be engaged, or at least that only those workmen who give negative results to those substances with which they come in contact should be employed. Bloch in the course of his researches has also demonstrated that the active antigen of the primula is a non-protein substance.

Mesotan Sensitization.—Mabel G. Silverberg² (Breslau) has made some experiments with 'mesotan', the methoxymethyl ester of salicylic acid, which has been used since 1902 for percutaneous treatment in those conditions which respond to salicylates. She finds that it is possible to make a certain number of persons generally hypersensitive to mesotan by the application of the drug on a relatively small area of the skin. The type of hypersensitiveness was monovalent, with the exception of one patient, who reacted also to a dilute solution of formalin. No urticarial element could be demonstrated, nor could Prausnitz-Küstner antibodies be demonstrated in the serum of hypersensitive patients or in blebs raised by carbon-dioxide snow at a distance from the area of application. These findings support the view of W. Jadassohn, that those hypersensitivities which call forth an eczematous reaction cannot be passively transferred by the methods now available.

Cotton-seed and Kapok Sensitization.—G. T. Brown³ has demonstrated by cutaneous tests that certain individuals are sensitive to cotton seed and kapok. The cotton plant and the kapok tree are botanically related, and persons sensitive to cotton seed are frequently, though not necessarily, sensitive to kapok. On the other hand, kapok sensitization without coincident cotton-seed sensitization probably does not occur. The ingestion of cotton-seed products, or the inhalation of dust from cotton or kapok, is capable of causing asthma and other allergic manifestations, including apparently both eczema and urticaria, in persons hypersensitive to these substances. The author believes that it is possible to desensitize patients by means of the injection of cotton-seed extract if sufficient judgement and care are used.

Chromium Salts.—C. P. McCord, H. G. Higginbotham, and J. C. McGuire⁴ have tested the skins of lithographers and tannery workers who used chromium salts in their occupation. The experiments were primarily done to test the truth of the view that it was necessary to have a breach of surface before these substances caused skin irritation. They applied to the normal skin of lithographers gauze dressings saturated with a 1 per cent and 4.5 per cent solutions of bichromate of potassium under rubber-tissue covers for twenty-four hours, water dressings applied in the same way being used as controls. In the case of tanners 4.5 per cent solutions of ammonium bichromate and 0.5 per cent solutions of chromic acid were used, with a solution of monosodium phosphate, phosphoric acid, and water with pH value of 3.8 as a control. Twenty out of 25 lithographers, and 10 out of the tannery workers, exhibited a dermatitis with potassium and ammonium bichromate respectively, while 4 out of 12 tannery workers exhibited a trivial papular dermatitis as a result of the action of 0.5 per cent chromic acid solutions. None exhibited any reaction from the controls.

Arsenic.—C. Halloran⁵ records the case of a patient suffering from exfoliative dermatitis, in which, owing to keratoses on the palms, arsenic was suspected as the cause. The patient recovered in hospital, but the condition recurred on return to her home. The wall-paper was suspected, and gave positive tests for arsenic. After the room had been re-papered no further recurrence took place.

REFERENCES.—¹*Jour. of State Med.* 1930, July, 373; ²*Arch. of Dermatol. and Syph.* 1930, Feb., 166; ³*Jour. Amer. Med. Assoc.* 1929, Aug. 3, 370; ⁴*Ibid.* 1930, April 5, 1043; ⁵*Arch. of Dermatol. and Syph.* 1929, Sept., 303.

SKIN STERILIZATION. (See PRE- AND POST-OPERATIVE TREATMENT.)

SKIN-GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Small whole-thickness skin-grafts for covering denuded areas have been found a simple and satisfactory procedure. Assuming there is a clean, raw surface, either fresh or granulating, on the arm or leg or elsewhere, the healthy skin in the neighbourhood is anæsthetized by infiltration with 1 per cent novocain solution and adrenalin, or 1-1000 percaïn solution with adrenalin. A straight bayonet-pointed needle lifts up a portion of the anæsthetized skin, and this is shaved off in its full thickness with a sharp knife. Each graft may be about the size of a threepenny-bit, and is lifted on the point of the needle to the area to be covered. Any number of small grafts may be used in this way. The grafts are covered with perforated oiled silk, and a marine sponge of suitable size is placed on top of this; a firm bandage exerts pressure on the sponge. The dressing need not be changed for four or five days, and in the great majority of cases the grafts take.

B. Douglas¹ refers to the 'sieve graft'. Large grafts are used which are uniformly perforated with small round openings. The perforations provide drainage over the entire surface; they are made with a steel die before the skin is disturbed (*Fig. 50*). When the perforations are made the skin is freed from



Fig. 50.—Steel die used in cutting out islands.

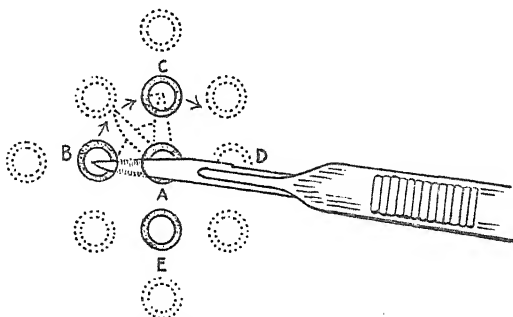


Fig. 51.—Illustrating method of undermining skin between islands. Dotted portions and arrows indicate successive positions of scalpel. (*Figs. 50, 51 re-drawn from 'Surgery, Gynecology and Obstetrics'.*)

the underlying tissues by undermining with a sharp-pointed knife, and is divided down to the subcutaneous tissue outside all the perforations. The perforated graft can be easily removed, leaving the donor site covered by small islands of skin (*Fig. 51*). Before the graft is placed in position all fat is removed from the under surface with curved scissors, and then it is sutured into position with interrupted stitches of silkworm-gut. The approximation

of the edges must be very accurate. The graft is dressed with vaseline gauze covered by several layers of dry gauze, and these are in turn covered with flat sea sponges sterilized in bichloride of mercury. Several layers, one on top of the other, are an advantage so as to exert elastic pressure on the graft. In the majority of cases it is not necessary to remove the sponge for ten days. The sieve graft gives better cosmetic results than the small deep graft referred to above. It has an advantage also over the Wolfe or full-thickness graft, which leaves a defect at the donor site that requires further grafting.

W. D. Gatch and H. M. Trusler² recommend the use of **Ultra-violet Light** in the preparation of infected granulation tissue for skin-grafting. They employ very thick Thiersch grafts. After grafting, the dressing employed is of the simplest kind. A single layer of sterile gauze is moistened with salt solution and laid directly on the grafted surface in good contact with the grafts. On top of this are placed numerous layers of loose dry gauze, and lastly large bunches of ordinary hospital wool held firmly under a final wrapping of cotton elastic bandage. The dressing is left undisturbed for five to seven days. They do not favour the use of oiled silk or rubber, and state that there may be no fear that the gauze will stick and pull the grafts loose. Subsequently, ordinary dressings wet with salt solution and changed daily are used until the wound is again clean. The thin outer layer of the graft will peel off in the same manner as cornified epithelium normally sheds itself. Their conclusions are as follows: (1) By the methods employed, Thiersch grafts cut to proper thickness and successfully transplanted give a better result than do whole skin-grafts. (2) The factors which render granulation tissue unsuited for grafting are cicatrix formation and infection. (3) Exposure to ultra-violet light is a valuable adjunct in the preparation of granulations. The surface must be beefy red, vascular, and free from exudates. (4) Excellent results may be obtained by dressing the grafts under pressure with dry gauze, wool, and elastic bandage. (5) For the grafting of small areas which will be subjected to trauma, and for flexor folds about joints, very thick Thiersch grafts are employed. Joints should be splinted in full extension until all tendency to cicatrization has ceased.

Stage Davis³ advises the removal of side scars and large disfigurements of the skin by gradual partial excision with closure. The method depends for its success upon the fact that the normal skin has a tremendous capacity to stretch, especially when the stretching is done slowly. He thinks that the procedure is simple, and the ultimate result in suitable cases very much better than wide excision followed by a skin-graft from a pedunculated flap. Many of the cases operated upon had already received radium and X-ray treatment. The successive excisions should ordinarily be made inside the area of the scar or other disfigurement until the final step is reached, when it may be necessary to encroach slightly on the surrounding tissue. By proceeding in this way the resulting narrow scar will be little if any longer than the long axis of the disfigurement. There is no contra-indication to cutting through large pigmented naevi, extensive hairy moles, cavernous angiomas, or keloids. The skin may stretch sufficiently in a week or two to allow for further operation, but frequently six months or more must elapse.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, June, 1018; ²*Ibid.* Feb., 478; ³*Ann. of Surg.* 1923, Oct., 645.

SKULL, FRACTURE OF.—(See MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

SLEEPING SICKNESS. (See TRYPANOSOMIASIS.)

SMALL-POX. (*See also* VACCINATION.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—N. M. J. Jitta¹ states that towards the end of July, 1929, an epidemic of small-pox introduced from the Dutch Indies occurred in Rotterdam. The cases were at first of a mild character, and the condition was called *alastrim*. Isolation was not enforced and the disease spread throughout Holland. It subsequently became more severe, though only at Rotterdam, where some deaths occurred among unvaccinated children or in adults who had not been vaccinated since childhood. While L. S. Hannema² regarded this outbreak as one of *alastrim* and not of true small-pox, a committee composed of W. A. Kuenen, J. Kuiper, and J. J. van Loghem,³ appointed by the President of the Dutch Health Council, came to the conclusion that the epidemic was really one of small-pox on the following grounds: (1) The clinical features supposed to be characteristic of *alastrim*—namely, absence of secondary fever, umbilication of the poeks, the peculiar factor, and scar formation—were not observed; (2) The mortality (5.4 per cent) was much higher than that of *alastrim*, especially in the 56 unvaccinated children under 10, whereas according to R. Jorge unvaccinated children suffering from *alastrim* show a higher recovery-rate than adults.

Yoannovitch⁴ states that in 1919, immediately after the War, the incidence of small-pox in Jugo-Slavia was 4.5 per mille. In 1924, however, owing to the preventive measures taken, it fell to 0.3 per mille. In the following years small-pox became sporadic, and in 1928 entirely disappeared from Jugo-Slavia.

According to J. D. Graham⁵ a few sporadic cases occurred in Aden at the beginning of 1929, and it was not until after the beginning of March that the outbreak assumed alarming proportions. The type of small-pox was very virulent, confluent and hæmorrhagic cases being very common. Among 213 unvaccinated cases 91 deaths occurred (a mortality of 42.72 per cent), and 25 deaths among 97 vaccinated persons (a mortality of 25.77 per cent). Of the 97 cases in vaccinated persons 35 were classified as modified small-pox, and in only 27 was there any information as to the interval between vaccination and the appearance of small-pox, the interval ranging from one to fifty-two weeks. Wholesale vaccination brought the epidemic to a close by the end of August.

SYMPTOMS AND COMPLICATIONS.—E. Leschke⁶ suggests the designation of 'variola mitigata' for the mild form of small-pox, otherwise known as *alastrim*, which is prevalent in North, Central, and South America, the Azores, Switzerland, England, and Holland. The following clinical features differentiate it from ordinary small-pox: rarity of prodromal petechial rashes in the abdomino-femoral triangle, absence of œdema round the poeks, lesser tendency to supuration and scar formation, slight degree of constitutional disturbance, and frequency of relapses. The mortality is usually under 1 per cent. On the other hand, the identity of *alastrim* and small-pox is proved by the following considerations: (1) The symptoms and character of the eruption are on the whole identical in both; (2) Paschen's corpuscles are found in both; (3) Inoculation of a rabbit's cornea with the contents of an *alastrim* pustule produces typical Paul's ulcers and Guarnieri corpuscles; (4) Inoculation of a rabbit's skin produces the same typical papules and pustules as those of vaccination; (5) A reciprocal immunity exists between the virus of *alastrim* and that of small-pox; (6) Vaccination is equally protective against both forms.

REFERENCES.—¹*Bull. Off. internat. d'Hyg. publ.* 1929, 1886; ²*Nederl. Tijds. v. Geneesk.* 1929, ii, 3775; ³*Ibid.* 4937; ⁴*Bull. Off. internat. d'Hyg. publ.* 1929, 1521; ⁵*Ibid.* 1895; ⁶*Munch. med. Woch.* 1929, Dec. 13, 2079.

SOFT SORE. (*See* CHANCROID.)

SPINA BIFIDA.

John Fraser, Ch.M., F.R.C.S.Ed.

Analysis of the site incidence of spina bifida shows that an overwhelming proportion of the cases are situated in the lumbosacral region of the spinal column. This fact is established by such an analysis as that of J. E. Moore,¹ the figures of which are that in 385 cases 81 per cent were lumbosacral, 9.5 per cent cervical, and 4.5 per cent upper or lower thoracic. There is much significance in this analysis, and, as the explanation of the site incidence is intimately related to matters of development, we may first consider the embryological aspects of the question.

Classification.—Recent literature has urged the adoption of a more descriptive and scientific terminology than has hitherto been observed. The generic term *rachischisis* is preferable to that of spina bifida, and with the addition of one or other of the qualifying adjectives *totalis*, *partialis*, *restricta* is supplied the description so far as extent is concerned. According to whether the neural groove remains open or is closed, the term *completa* or *incompleta* is added. It is claimed that by variation of these terms a terminology may be coined which is both accurate and descriptive.

Miss Keiller² has suggested that, in order to keep in view the close association between the developmental influence and the clinical condition, three classes of the error should be recognized: (1) Errors primarily limited to disturbance of the mesoblast; (2) Errors mainly mesoblastic with associated ectodermal disturbance; (3) Errors mainly ectodermal with associated mesoblastic disturbance. She adds that it is probable that the real and primary error common to all these groups is ectodermal in character, but that in Group 1 and to some extent in Group 2 the influence of the primary error is obscured by subsequent growth along normal lines. Though these additions to the terminology have undoubted advantages, we nevertheless continue to supplement them by the familiar clinical terms of spina bifida occulta, meningocele, myelocele, and others. The modern classification may be summarized as follows:—

Group 1: Error limited to the mesoblast.

Rachischisis incompleta restricta.

- a. Spina bifida occulta.
- b. Meningocele.

Group 2: Error primarily mesoblastic with associated ectodermal error.

- a. Myelo-meningocele.
- b. Hydro- or syngo-myo-meningocele.

Group 3: Error mainly ectodermal with secondary mesoblastic disturbance.

Myelocele—restricta, partialis, or totalis.

Pathology.—It is obvious that in a summary of this description it is impossible to enter in any detail into the problem of pathology. Facts of general interest only will be alluded to.

Spina Bifida Occulta (Plate LI, A).—It will be recalled that in spina bifida occulta the spinolaminar segment of the vertebral column is deficient over a restricted area, and that a fibrous band, the membrana reuniens, passes between the meninges and the overlying skin. We are now inclined to believe that certain examples of this disorder are actually meningoceles in which the sac has undergone obliteration.

Meningocele (Plate LII, C, D).—A meningocele is essentially a fluid-containing

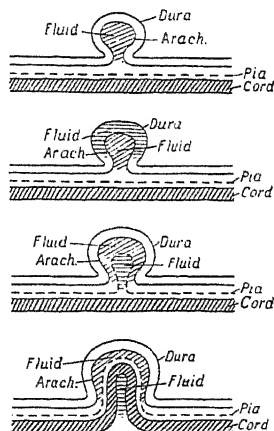


Fig. 52.—Diagrammatic representation of the four varieties of spina bifida of the meningocele type.

protrusion of meninges through a congenital defect in the spinolaminar segment. The pathology has lately been extended to include certainly three and possibly four varieties of the error. These types are represented in the accompanying illustration (Fig. 52); the fourth form, that in which the spinal cord forms a content of the sac, is a doubtful possibility.

The Myelo-meningocele (Plate LI, B).—In this variety an imperfect cord is adherent to the integument, and in the existence of an accompanying accumulation of fluid the neural tissues may form a part of the convexity of the sac. It is probable that this variety is confined to the lumbosacral region, and that it owes its origin to the embryological fact of the coccygeal segments being adherent to the epidermis in this situation.

The Hydro-myelo-meningocele.—The distinctions of this type are that the neural tube has closed and the cord has therefore formed, but it has remained adherent to the surface ectoderm; at the same time the central canal has become distended with fluid. In certain instances a meningeal fluid-containing sac exists.

The Myelocele, Partial or Complete.—A more or less complete arrest of neural development results in the formation of a myelocele, and according to its extent the error may be complete, partial, or restricted. The restricted type (the only one compatible with life) arises in the lumbosacral region, and its place incidence is undoubtedly related to the close association in this region between the epidermis and the lowest coccygeal segments.

While the dorsal surface of a myelocele is devoid of any membranous covering, this exists on the ventral aspect, and the accumulation of fluid between cord remnant and meninges may give the error such a cystic appearance as to cause it to be confused with a myelo-meningocele.

In concluding this general summary of the pathology, mention should be made of certain facts which are common to the majority of spina bifida errors: (1) Hydromyelia in varying degrees accompanies most of the errors; (2) When the neural tissue is attached to the overlying epidermis there is a tendency for the cord above the site of the lesion to be dragged downwards, and as growth proceeds this complication tends to be exaggerated; (3) If the spinal cord exists distal to the error, it is apt to be imperfectly developed.

The Incidence of the Error.—The Report of the London Clinical Society Committee on spina bifida³ gave the following figures: 57 cases in 36,148 births (Demme); 22 cases in 22,293 births (Chaussier). J. A. Harrar⁴ recorded 59 cases in 91,600 births. An average of these figures gives a proportion of 1 in 900 births. Barnett Joseph⁵ places the incidence at 1 in 1000 births. It is evident that these figures do not include spina bifida occulta cases. S. H. Clark⁶ quotes the proportion of this type as amounting to 5 per cent of the total, but the figure is probably an underestimate, as Clark evidently included in his statistics only those cases associated with nervous symptoms.

The Incidence of Type.—E. D. Fenner⁷ gives the proportion of types as: meningoceles 10 per cent, myelo-meningocele 70 to 80 per cent; Miss Keiller² analysed 170 cases into the following groups:—

| | CASES | PER CENT |
|---|-------|----------|
| Spina bifida occulta (with symptoms) .. | 7 | 4.1 |
| Meningocele (adherent cauda equina) .. | 4 | 2.3 |
| Pure meningoceles | 36 | 21.1 |
| Myelo-meningocele | 120 | 70.6 |
| Hydro-myelo-meningocele | 3 | 1.9 |

It is significant that 78 per cent of the cases were associated with involvement of the spinal cord or nerve-roots, and the high percentage of myelo-meningocele types is evident.

PLATE LI

SPINA BIFIDA

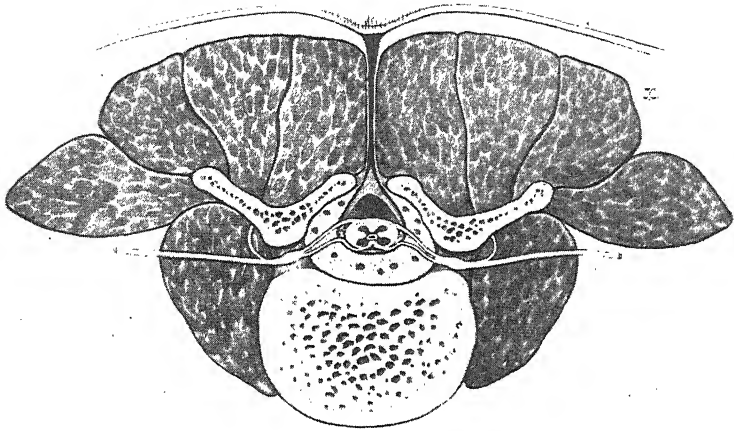


Fig. A.—A SPINA BIFIDA OCCULTA IN TRANSVERSE SECTION. The membrana reunies extends to the deeper layers of the skin and to the dura mater. The posterior layers of the dura tend to become herniated through the defect in the vertebral column, while the anterior portion of the dura is drawn against the anterior surface of the spinal cord and its related nerve-roots.

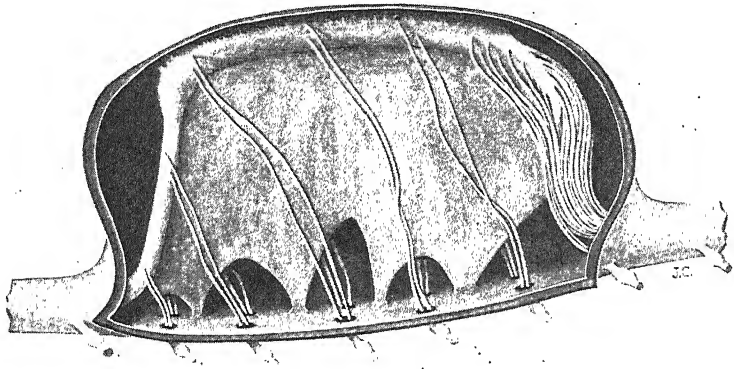


Fig. B.—STRUCTURE OF THE MYELO-MENINGOCELE AS SHOWN ON VERTICAL SECTION (LEFT LATERAL VIEW). The arachnoid septa and left ligamentum denticulatum have been removed in order to expose the plane of the left nerve-roots. The spinal cord is seen passing from the vertebral canal to the fundus of the sac, where it is attached in a plaque-like form. The termination of the cord, together with the cauda equina, is leaving the fundus of the sac at its lower end to re-enter the vertebral canal. The remarkable expansion of the ligamentum denticulatum is well shown.

*Plates LI and LII by kind permission of the
"Edinburgh Medical Journal"*

PLATE LII

SPINA BIFIDA—*continued*



Fig. C.—CLINICAL APPEARANCE OF A LUMBOSACRAL MENINGOCELE.

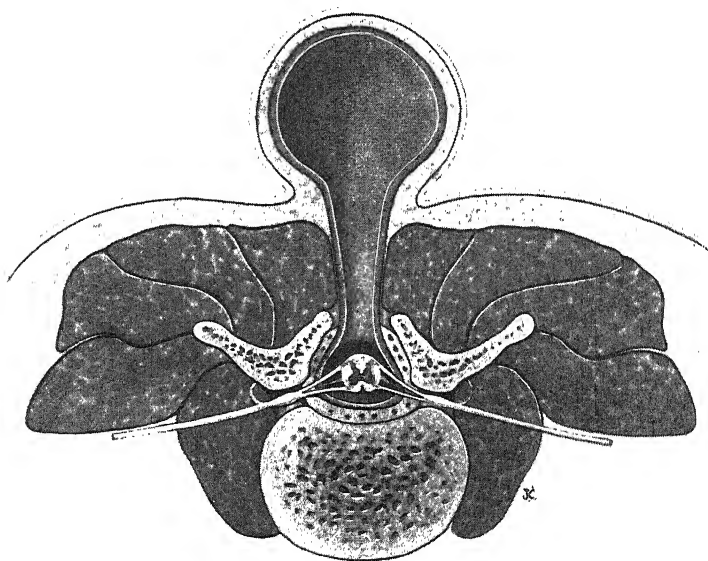


Fig. D.—STRUCTURE OF THE MENINGOCELE AS SHOWN IN TRANSVERSE SECTION. Note that the spinal cord, the nerve-roots, and the ligamenta denticulata are normal in outline and position. The cavity of the meningocele is in direct continuity with the subarachnoid space and is filled with cerebrospinal fluid.

PLATE LIII

DEMONSTRATION OF SAC CONTENTS IN SPINA BIFIDA



Fig. A.—X-RAY APPEARANCES OF SACRAL MENINGOCELE IN A CHILD, AGE 3 MONTHS, AFTER REPLACEMENT OF 70 c.c. OF CEREBROSPINAL FLUID BY OXYGEN. There is an osseous defect in the neural arches of the sacrum. The meningeal sac and spinal theca are clearly outlined by their content of oxygen. The large globular sac is seen to be connected by a narrow neck with the theca. Its walls are smooth, and no contents are outlined. (X-ray by Dr. J. W. L. Spence.)

*Plates LIII-LVI by kind permission of the
'Edinburgh Medical Journal'*

PLATE LVI

DEMONSTRATION OF SAC CONTENTS IN SPINA BIFIDA—*continued*



Fig. D.—OXYGEN X-RAY OF CASE OF MYELO-MENINGOCELE. The spinal cord is seen leaving the vertebral canal to pass into the area medullo-vasculosa. From this area a number of nerve-roots are seen passing forwards across the sac cavity to re-enter the vertebral canal. The distended outline of the sac wall is shown. (X-ray by Dr. J. W. L. Spence.)

The Course of the Disease.—It is fully realized that the disorder is associated with a high immediate mortality. The London Clinical Society reported 649 deaths in spina bifida cases in 1882, of which number 612 cases were in the first year of life. In Harrar's series of 68 cases 7 were still-born, and 29 died untreated within a few weeks of birth. Miss Keiller's figures recount 49 fatal untreated cases in a total series of 107. The causes of death are marasmus, rupture of the sac with secondary infection, meningitis, hydrocephalus, and the existence of severe congenital anomalies of the visceral system.

In those cases which survive, the progress of health is in inverse ratio to the severity of the lesion, and throughout the early years of life there is a considerable possibility that hydrocephalus may develop. In Harrar's series (68 cases) 23 developed primary hydrocephalus and 10 showed secondary hydrocephalus (i.e., after operation).

The Possibility of Natural Cure.—It is an established fact that a certain proportion of cases undergo a spontaneous cure, and the percentage is larger than might be anticipated. The occurrence takes place, of course, in those cases which for various reasons are considered unsuitable for operative interference. In 60 such cases (London Clinical Society) 14 (23.3 per cent) were spontaneously cured by gradual shrinkage or by shrinkage which was secondary to ulcerative rupture.

Treatment.—The only type of treatment to be considered is that of operation, and it is the opinion of the great majority of writers that in only a small proportion of the mild type of defect is there hope of recovery without operative interference.

The problem of operability must be a matter for individual opinion, but it is generally accepted that the coexistence of hydrocephalus or of extensive paralysis is a contra-indication.

The most appropriate time for operation is a highly important detail. Jacques Leveuf⁸ says, "All spina bifida cases in which the cord is exposed ought to be emergency operations, operated on immediately after birth". With this we agree, for in early operation lies the best hope of preventing secondary infection of the exposed area. It is important, however, to distinguish between a spina bifida with exposed cord and one in which the sac is ulcerated at birth. In the latter case the cord tissue is protected by a layer of connective tissue, the ulcerated area affects the epidermis, and in such instances it is wise to delay operation until healing has occurred.

In the pure meningocele, operation should be performed during the first four weeks of life, thus avoiding the risks of rupture and ulceration, while the procedure is carried through at a time when shock is relatively slight. That rupture and ulceration are likely possibilities if operation is unduly delayed is established by the records of literature. In 117 cases rupture occurred 27 times, in 24 of the cases ulceration developed (Keiller); in 34 cases recorded by Harmer 64.7 per cent ulcerated.

Technique of Operation.—In cases of pure meningocele the operation is a relatively simple matter. The sac, exposed by appropriate incision, is carefully opened, any nerve tissue which it may contain is freed and returned to the vertebral canal; it then remains to remove redundant sac and to close the remaining edges accurately by interrupted or continuous sutures. Thereafter the approximation of muscle, fasciæ, and integuments in successive layers is secured. In a recent paper M. Yovtchitch⁸ describes a blind ligature of the sac pedicle, but such a procedure is highly unwise, as it may mean the division and sacrifice of valuable nerve tissue lying within the sac wall.

The real difficulties of operation arise in the myelo-meningocele, which constitutes some 80 per cent of our cases. In such the sac wall is exposed and opened to one or other side of the mid-line in order to avoid damage to nerve tissue in the sac roof. All nerve filaments are dissected free and carefully preserved. If it is shown that these are in continuity with the cord above the lesion, their preservation is essential. The real difficulty is to know how best to deal with the tissues of the rudimentary cord. La Ferte⁹ attempts to tubularize it, but it is believed that such a procedure increases the risk of sepsis.

Miss Keiller recommends an oblique section of the cord on the proximal side of the attached area, the obliquity being with a view to preserving as much nerve tissue as possible. Bleeding is arrested by undercutting and ligaturing the spinal arteries; the cut end of the cord should not be ligatured. The end of the cord is afterwards returned to the cavity of the vertebral canal, and the operation is concluded by closure of the sac edges and the various overlying tissues.

Post-operative Progress.—In the after-treatment, nursing on the face is a most important detail, and of course all appropriate measures are taken for the treatment of shock. In certain cases the operation is followed by an exaggeration of paralysis, chiefly evident in the sphincters. This may be due to oedema, in which case improvement will follow. Paralysis which has existed before operation is unlikely to be benefited by surgery except in so far as the liberation of the cord may preserve that structure from trauma by continual traction.

Operative Mortality.—In considering this question Moore's figures may be recalled. The immediate post-operative mortality was 27 per cent, with an additional 7 per cent within three months of operation—a total of 34 per cent. Moore added that a further follow-up of the cases brought the ultimate figure to the neighbourhood of 50 per cent. J. Fraser¹⁰ recorded a mortality of 37 per cent in 130 cases. The figure is affected by a variety of factors, but of pre-eminent importance is the morbid anatomy of the error; the post-operative mortality of the meningocele, for example, is infinitely less than that of the myelo-meningocele. This point is well brought out by Leveuf. In cases of pure meningocele the operative mortality was 7.8 per cent; in a series of myelo-meningoceles the figures under similar conditions were 44.5 per cent. The comparison is a striking one, and it illustrates how closely the prognosis is affected by the matter of type. The high mortality of the second group is dependent upon post-operative shock, sepsis, and secondary fistula formation.

Final Results.—It must be confessed that, except in so far as the removal of the defect is concerned, the late results are disappointing. There is improvement of paralysis in only a small proportion of cases; 15 per cent develop hydrocephalus within a year of the operation, and 6 per cent succumb to infection and meningitis (T. W. Harmer¹¹).

A Method of Demonstrating Sac Contents in Spina Bifida.—Accurate pre-operative knowledge of the position and relation of nerve tissue in the sac of a spina bifida would be a most obvious advantage. A method by which this knowledge may be obtained has been demonstrated by Fraser.¹⁰ With aseptic precautions the sac is punctured by a hollow needle attached to a Record syringe, 10 to 15 c.c. of fluid are removed, and replaced by a corresponding amount of oxygen gas. The process is repeated until the sac contains a sufficiency of the gas.

The sac wall must not be put under undue tension, or sloughing may result,

and for some days after the procedure the child's head should be kept at a lower level than the sac area. Lateral and anteroposterior X-rays are taken as soon as the injection is completed. The accompanying photographs (Plates LIII-LVI) demonstrate the value of the method as a means of orientating the sac contents.

Spina Bifida Occulta in Relation to Nocturnal Enuresis.—Jacobovici¹² insists on the importance of excluding spina bifida occulta as a cause of nocturnal enuresis. He recalls Fuchs's observation in 1909 that in 125 soldiers of the French Army suffering from enuresis 74 demonstrated a spina bifida occulta error of the 5th lumbar and 1st sacral vertebrae. In no case was there external evidence of the abnormality.

Jacobovici's series includes sixteen cases, the ages ranging from 4 to 16 years. At operation it was noticed that an undue quantity of fatty tissue occupied the vertebral canal, but in only a small proportion was a membrana reuniens demonstrable. In three cases the dural sac was found to descend to a low level, the 3rd sacral vertebra—a finding which seems to indicate that undue fixation of the coccygeal segments to the overlying epidermis had resulted in a downward traction on the cord.

The operation consisted in the removal of extradural fatty and fibrous tissue and the division of any abnormal fibrous bands. The results in 15 operations were as follows: 9 cases were cured, 4 were improved, 1 showed no benefit, and 1 died. In one case an affliction of thirteen years' duration was immediately and completely cured by the operation.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1905, i, 137; ²*Brain*, 1922, xlv, 31; ³*Trans. Clin. Soc. Lond.* 1885, xviii, 339; ⁴*Bull. of Lying-in Hosp. N. Y.* 1915-16, x, 143; ⁵*Amer. Jour. Dis. Child.* 1913, v, 285; ⁶*Jour. Nerv. and Ment. Dis.* 1918, xlviii, 261; ⁷*New Orleans Med. and Surg. Jour.* 1917, lxx, 42; ⁸*Bull. et Mém. Soc. nat. de Chir.* 1929, Oct., 1080; ⁹*Amer. Jour. Orthop. Surg.* 1909-10, vii, 469; ¹⁰*Edin. Med. Jour.* 1929, May, 284; ¹¹*Boston Med. and Surg. Jour.* 1917, clxxvii, 353; ¹²*Presse méd.* 1929, Aug. 24, 1193.

SPINE, INJURIES OF. (See also MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

E. W. Hey Groves, M.S., F.R.C.S.

Serious injuries of the spine must be subdivided into two main groups for the purpose of treatment. In the first there is damage to the spinal cord, and in the second the nervous system is unaffected. In regard to the treatment of fracture-dislocation of the spine with paraplegia there is an increasing consensus of opinion that operative treatment is quite useless. Probably this is too sweeping a statement, as there may very rarely be cases where a loose fragment of bone damaging the cord may be removed. On the other hand, injuries of the spine which have no cord symptoms have become a much more important problem in recent years. This is on three accounts: (1) Because machinery and motor-car accidents are so much more common; (2) Because improved X-ray technique has enabled us to make more accurate diagnosis; and (3) Because industrial insurance has to pay so heavily for any neglected case of an injured spine. A further subdivision of injuries to the vertebral column is that between fracture-dislocation and compression fractures. A fracture-dislocation affects chiefly the articular processes and intervertebral discs. The articular processes are almost necessarily broken before dislocation can occur, except in the cervical region, where a pure dislocation is possible. In the compression fracture it is the body of the vertebra which is damaged, being compressed from above downwards with the accompaniment of slight kyphosis. This latter type of injury is extremely important because it may lead to very serious late results when the nature of the original injury has been quite overlooked. The key to the diagnosis of the condition consists in good X-rays taken from a lateral view.

R. W. Harbaugh and R. E. Haggard¹ have collected a number of interesting statistics with a view to determining the amount of disability caused by *fracture-dislocation* of the spine, and especially as to the comparative rate and completeness of recovery following operative and non-operative treatment. For many years past surgeons have been accustomed to operate on cases of fracture-dislocation of the spine with a view to hastening and promoting bony union. Two types of operation have been performed; the one associated with the name of Albee places a graft along the spinal processes, and the other, that of Hibbs, attempts a fusion of the spinous processes together with an ankylosis of the articulations. The paper just quoted illustrates the very great difficulty of statistical inquiry, and unfortunately as far as its main results are concerned it is negative—that is to say, the rate of recovery and the completeness of recovery are practically the same for the operated as for the non-operated cases. The obvious criticism of this inquiry is that probably the cases operated upon were of greater severity than those treated by conservative methods.

J. Dunlop and C. H. Parker² give a good description of the conservative treatment of *compression fractures* of the spine, and their article is illustrated by a number of small diagrams taken from X-rays showing that the manipulative treatment really does restore the broken vertebral body to something very like its normal shape and size. The principle of the treatment recommended is that of traction and hyperextension, followed by fixation and plaster. The patient is anesthetized, laid upon his face, two men pull on the legs, and two more upon the trunk by a folded towel passed in front of the chest and behind the armpits. Pressure is made upon the spine opposite to the injury, this spot usually being marked by an abnormal prominence; whilst the back is held in this position of hyperextension the plaster jacket is applied. If cases are treated in this way from an early stage, the authors of this paper consider that the recovery will be both rapid and complete. In one case, for example, of a heavy man who had a compression fracture affecting the 2nd, 3rd, and 4th vertebræ, the patient was able to walk six months after his accident, and to return to his work, which involved the riding of a motor-bicycle, four months later. In using this form of treatment it is noted that the best results are obtained in the treatment of fractures below the 9th dorsal vertebra. The explanation of this is that below this point it is possible by manipulation to alter the shape of a broken vertebral column, because it is not held rigid by the attachment of the fixed portion of the thorax.

Injuries of the *cervical portion* of the spine in many respects are quite different from those affecting the rest of the vertebral column. For, on the one hand, any involvement of the cord is either fatal or produces paralysis of all the limbs, and on the other, injuries of the spine not affecting the cord differ from those lower down, because dislocation cannot occur without a fracture. Two recent American papers deal with this subject and should be read in conjunction with one another.

A. S. Taylor³ lays great stress upon a point which is often overlooked—namely, that dislocation of the vertebræ necessarily involves rupture of one or more intervertebral discs, and that these structures usually become absorbed after the injury, with resulting fusion of the vertebræ. It seems to us that this point is one of great importance, the accuracy of which should be examined by surgeons and radiologists who have these cases under their care. It is probable that tearing of an intervertebral disc sometimes leads to its disappearance, but it is equally certain that this is not always the case. Taylor strongly advocates immediate manipulative treatment of all cases of fracture-dislocation of the cervical spine, other than those in which there is a cord

lesion that is likely to prove rapidly fatal. The patient is anæsthetized on a Hawley's table, steady traction is made upon the head, with manipulation by pressure and lateral flexion over the site of the injury, reduction of the deformity is verified by an immediate X-ray, and the neck is then fixed in plaster.

M. Langworthy¹ also writes on the reduction of dislocations of the cervical spine. He describes no fewer than thirty of these cases in which rather more than half were bilateral and the rest unilateral. The bilateral cases were 17 in number, of which 8 had evidence of spinal-cord injury, and 5 of these died. His series contains instances of dislocation between each of the adjacent cervical vertebræ, but the joint between the 5th and 6th vertebræ is affected far more commonly than any other. The unilateral cases present a subject of great interest; they were 13 in number, and it is very difficult to give any positive proof of the diagnosis. Unlike the bilateral cases, the unilateral injuries give no clear X-ray picture except in the case of the displacement of the atlas upon

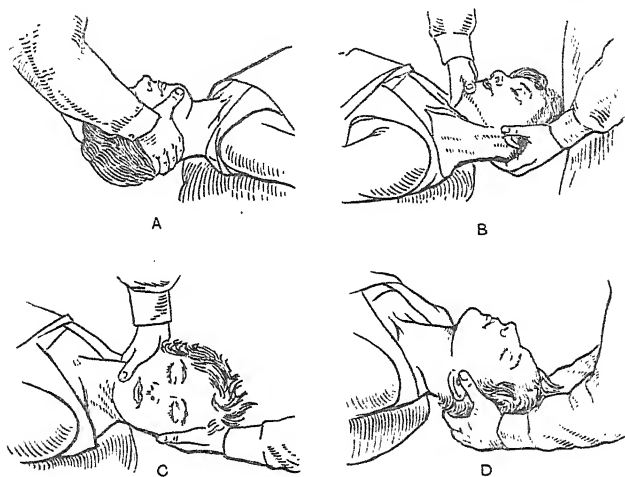


Fig. 53.—Steps in the manipulation as done to reduce a left-sided dislocation between cervical vertebræ. A, The side of the hand used as a ruler, over which the head is bent to the right as in B; C, Head rotated to the left to complete the reduction; D, Head hyperextended to prevent re-dislocation. (Re-drawn from the 'Journal of the American Medical Association'.)

the axis. The characteristic features of the case are the development of pain on one side of the neck with rigidity, the head being held rather on one side, towards the lesion, and the chin tilted to the opposite side, exactly like a case of torticollis. It is evidently a matter of very great importance to be able to recognize this condition, resulting from a blow, so that it may be corrected by manipulation (Fig. 53) before permanent deformity occurs. Probably many observers have failed to make a diagnosis because they did not recognize that the X-ray would fail to show the dislocation. Langworthy maintains that reduction can be effected up to eight months after the injury. Obviously it would be far better to carry out treatment at a much earlier period.

The Nursing of Spinal Cases.—One of the very great difficulties of treating any case of spinal disease, whether it has been operated upon or not, is that of nursing the patient so that the back may be exposed as often as necessary without moving the diseased or injured vertebræ. For example,

in an ordinary case of fracture-dislocation of the spine with paraplegia it is urgently necessary to expose the skin of the back and buttocks every day so that this may be preserved from bedsores. This exposure is extremely difficult by any system of turning or rolling the patient without involving grave risk of damaging the diseased spine. In order to meet this difficulty a reversible bed-frame (*Plate LVII*) has been designed by E. W. Hey Groves.⁵ Its principle consists in placing the patient in a metal cage, which actually forms the bed-frame. He lies upon a divided mattress, and when he has to be turned he is covered in by a second divided mattress, which is swung in front of him on hinged metal frames, so that when he is ready to be turned the patient is securely fixed between mattresses at his back and front. The bed cage can then be revolved round a longitudinal axis so that the patient's back is uppermost, the back mattress is swung aside and the patient's back exposed. This contrivance not only effects the two main objects aimed at—namely, easy exposure of the back and immobilization of the whole trunk—but also renders the nursing of these difficult cases comparatively easy, so that one competent nurse can undertake the case single-handed.

Injuries to the Intervertebral Discs.—The part played by the intervertebral discs in injuries, disease, and deformities of the spine has not been sufficiently recognized. This is due very largely to the fact that these structures do not appear in X-ray pictures. In recent years, however, largely owing to the researches of G. Schmorl,⁶ we are coming to realize that they play a very important part in many obscure lesions. J. Calvé and M. Gulland⁷ have recently summarized the known facts about these structures and have given a comprehensive list of other papers dealing with the subject. Each disc consists of two parts—a central part, which is almost fluid, the nucleus pulposus; and a peripheral part, the annulus fibrosus. This arrangement constitutes a veritable hydraulic buffer between the adjacent vertebral bodies. As is the case with cartilaginous structures in other parts of the body, the discs have a very poor capacity for repair after injury, owing to the absence of a blood-supply. If, therefore, a disc is torn by dislocation or affected by disease, it will not be regenerated, but the vertebræ adjacent to it will fall together and undergo bony or fibrous ankylosis. In some cases spontaneous calcification of the discs occurs, and this is one of the anomalies which can be recognized by the X rays (*Plate LVIII*), but it does not seem to have any definite clinical significance. (*See also X-RAY DIAGNOSIS.*)

The most important new conception about the discs is the idea that they may undergo displacement. Such displacement is described in two varieties. In one there is a sort of hernia of the soft disc substance into the adjacent cancellous tissue of the vertebral body. A small degree of such hernial displacement is found in a large number of specimens of the vertebral column examined post mortem. In the great majority of such cases the anomaly has no practical importance. In a few cases, however, the condition can be recognized during life in a lateral X-ray picture, and in these there are often symptoms of indefinite pain in the back. The other type of displacement is very much more definite. The whole disc is displaced backwards towards the cord, the vertebral bodies fall together, and some degree of kyphosis results. Such a displacement is usually seen in the so-called cases of postural kyphosis in adolescents, and in some of these a greater or less degree of paraplegia may result.

W. E. Dandy⁸ has reported two very remarkable cases of this posterior displacement, in which the pressure on the cord was so definite as to simulate very closely a tumour of the spinal cord. In both cases the cause was trauma, the first symptoms were pain radiating down both legs, worse on one side,

PLATE LVII

BED-FRAME FOR SPINAL CASES

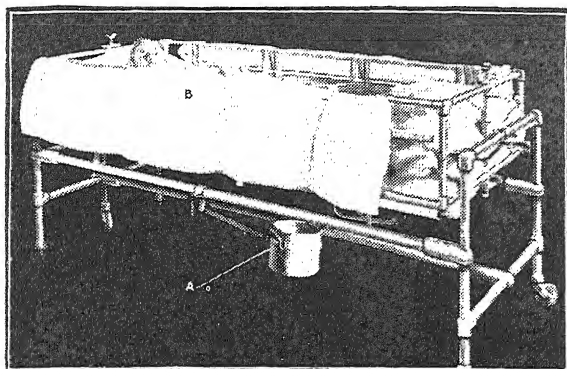


Fig. A.—Shows the patient lying on his back, the head raised on a pillow. A bolton (A) works in such a way that, when pushed into place under the buttocks, it rises close under a bolt in the mattress. The half-mattresses (B) are not required, remain flat against the sides of the cage.

Fig. B.—Shows the patient being turned over. The gap in the mattresses is shown at C. The cage is revolved after releasing the catch C.

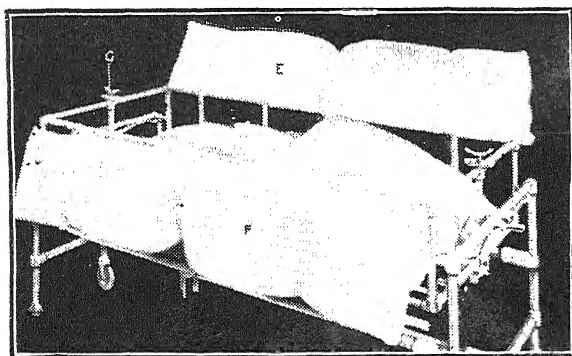
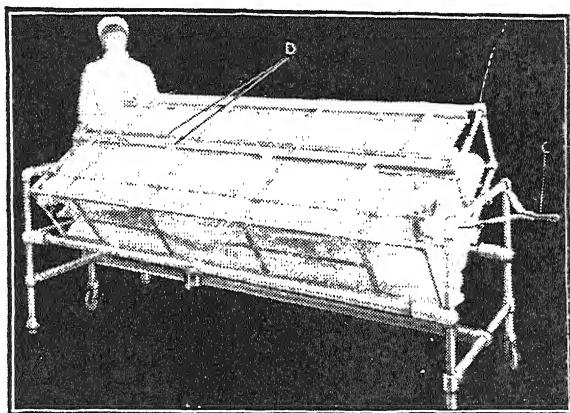


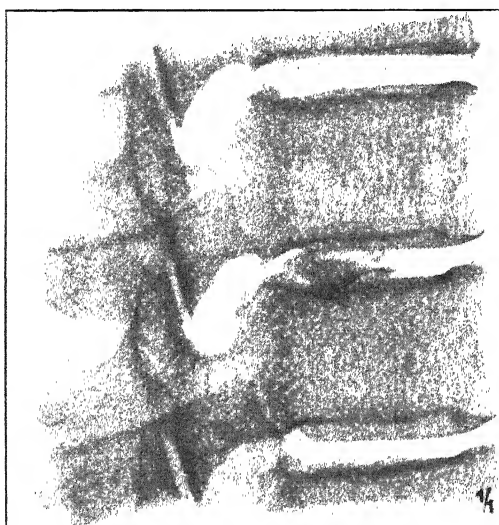
Fig. C.—Shows the cage reversed, and the half-mattresses (E, F) being opened and fastened to the side. The patient's back is now fully exposed. The cage is locked in position by means of the catches (G) at the head and foot.

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PLATE LVIII

CALCIFICATION OF THE INTERVERTEBRAL DISCS

(J. CALVE AND M. GALLAND)



Calcification of the nucleus pulposus.

By kind permission of the 'Journal of Bone and Joint Surgery'

severe pain in the back, rigidity of the spinal muscles, and marked tenderness over the affected region of the spine. At a later date sensory and motor paralysis with urinary incontinence developed. Operation revealed in each case that a cartilaginous tumour formed by a displaced disc was pressing backward upon the cord. The removal of this cartilaginous tumour was followed by a gradual recovery of motor power.

REFERENCES.—¹*California and West. Med.* 1930, May, 325; ²*Jour. Amer. Med. Assoc.* 1930, Jan. 11, 89; ³*Ann. of Surg.* 1929, Sept., 321; ⁴*Jour. Amer. Med. Assoc.* 1930, Jan. 11, 86; ⁵*Brit. Med. Jour.* 1930, i, 66; ⁶Quoted by Calvé; ⁷*Jour. Bone and Joint Surg.* 1930, July, 555; ⁸*Arch. of Surg.* 1929, Oct., 666; *Abst. Surg. Gynecol. and Obst.* 1930, March, 246.

SPINE, TUBERCULOSIS OF. (See TUBERCULOSIS, SURGICAL.)

SPIROCHÆTOSIS ICTEROHÆMORRHAGICA. (See JAUNDICE, INFECTIVE.)

SPLEEN, SURGICAL AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Rupture of the Spleen.—Traumatic ruptures of the spleen are often associated with injuries of the kidney, and R. Desjardes,¹ of Lyons, relates a case in which both the spleen and the left kidney had to be removed, and recovery resulted. The patient was a girl of 7.

Hamilton Bailey,² and also J. Schachnowitz,³ report cases of spontaneous rupture of the spleen, and about eleven more are quoted from the literature.

Two papers have appeared, the one in Great Britain by W. Anderson and J. Gray,⁴ the other in France by P. Bertrand and C. Clavel,⁵ on rupture of an aneurysm of the splenic artery. The former have collected 58 cases from the literature, and show that there is often a previous history of pain like that of gastric ulcer, and occasionally a swelling is found. The perforation gives rise, of course, to the signs of grave internal hæmorrhage; only three appear to have recovered. The French writers relate a personal case which lived for fifty-five days, and collect 27 from the literature, with another success. They say that the hæmorrhage may be either intraperitoneal or into the stomach, and is apt to be moderate at first and fierce later. The condition is evidently one to be borne in mind by surgeons. The best treatment is to ligature the artery and remove the spleen if the aneurysm is close to the hilum, and to tie the artery proximal and distal to the aneurysm if it is farther to the right. The numerous branches to the pancreas will maintain such a free collateral circulation that proximal ligature alone will often fail.

Indications for Splenectomy.—There was a valuable discussion on this subject at the Royal Society of Medicine⁶ in May, 1929. H. Thursfield said that from the point of view of the physician there are now three well-established indications; splenic anæmia, congenital acholuric jaundice, and the chronic type of recurrent purpura. Splenic anæmia is characterized by an enlargement of the spleen, anæmia of the secondary type, diminished leucocytes, and diminished or normal fragility of the red cells. Acquired acholuric jaundice often reacts well to splenectomy. A. J. Walton discussed the various indications in detail. Of 33 cases of splenic cyst collected by E. Bircher, puncture was followed by 4 successes and 2 deaths, incision and drainage by 8 cures and 1 death, resection by 3 cures and 1 death, and splenectomy by 15 successes and no fatalities. Splenic anæmia responds well to splenectomy, but when it is associated with cirrhosis of the liver, enlarged at first but shrunken later, with ascites (Banti's disease), the prognosis is graver; Chaney found that under these circumstances the operation mortality is 23 per cent. Half the survivors

remained in good health (Sweetser). In von Jaksch's anæmia, Hodgkin's disease, cirrhosis of the liver, and pernicious anæmia, removal of the spleen is not indicated, nor in polycythæmia, aplastic anæmia, or leukæmia. The cases of purpura that do so well after operation are those called thrombocytopenic purpura hæmorrhagica, showing a tendency to recurrent bleeding, a low platelet count, a prolonged bleeding-time, a failure of the clot to retract, a normal clotting-time, and the appearance of petechiæ below a tourniquet. The spleen is small and not adherent, and can be removed with ease. In cases of Gaucher's disease the liver is often enlarged, and the whole of the reticulo-endothelial system may be affected; there may be anæmia and a bronzed skin. The spleen may be removed if it is a local nuisance or if there are hæmorrhages and anæmia, but the operation will not cure the disease.

In operating Walton uses an incision in the line of the intercostal nerves, well over the ribs and down to the umbilicus. If the mesenteric glands are enlarged, it is a bad sign. He begins at the hilum of the spleen, isolating the artery and veins and tying them. The veins may be very fragile. The tail of the pancreas and the greater curvature of the stomach are both liable to injury at this stage. Then the spleen is drawn out and the adhesions are dealt with; it is often necessary, when these are deep, to separate them with the hand in spite of free bleeding and to get the spleen away, and then to deal with the vessels. This is greatly facilitated if the main artery has already been tied. A. F. Hurst and other speakers referred to the fact that severe hæmatemesis may be the first evidence of either splenic anæmia or purpura hæmorrhagica (a misnomer, because there may be no purpura).

H. Ahlbom⁷ mentions two cases of hæmatemesis with splenomegaly, cured by removal of the spleen.

Egyptian Splenomegaly.—This condition, common in Egypt and very fatal, is apparently due to infections with *Bilharzia mansoni*. H. E. S. Stiven⁸ has removed 390 spleens for this disease, with a mortality of 13 per cent, and great benefit to the survivors. They must have a period of pre-operative treatment, with **Carbon Tetrachloride**, **Tartar Emetic**, and '606', to free them of parasitic infestation and syphilis, and a generous **Diet**. He operates under a spinal anæsthesia.

REFERENCES.—¹*Lyon Chir.* 1930, Jan., 17; ²*Brit. Jour. Surg.* 1930, Jan., 417; ³*Deut. Zeits. f. Chir.* 1929, ccxiii, 283; ⁴*Brit. Jour. Surg.* 1929, Oct., 267; ⁵*Lyon Chir.* 1929, Sept., 641; ⁶*Proc. Roy. Soc. Med.* 1929, Sept., 1493; ⁷*Acta Chir. Scand.* 1928, lxi, 357; ⁸*Brit. Jour. Surg.* 1929, Oct., 230.

SPLENOMEGALY, GAUCHER'S, IN INFANCY. (See GAUCHER'S SPLENOMEGALY.)

SPRUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Important biochemical investigations of sprue, with a practical bearing on treatment, have been recorded during the past year. N. H. Fairley¹ regards the disease as an atrophic degeneration of the digestive tract accompanied by megaloblastic inflammation of the bone-marrow. Jejunal involvement prevented the digestion of the sugars by the succus entericus, and atrophy of the ileum inhibited absorption of fats, calcium, and vitamin D, with resulting gaseous fermentation in the bowel and bulky light-coloured stools containing great excess of fat. The aplasia of the megaloblastic bone-marrow produced malnutrition with anæmia, often associated with deficient hydrochloric-acid secretion, as in the pernicious type. The serum-cholesterol was also much lowered in severe cases. The pathological changes indicated treatment by **Alimentary Rest** with the administration of **Calcium** and **Hydrochloric**

Acid, together with **Liver Extracts** for the anæmia. In order to allow of rest to the intestinal mucosa it was essential to restrict very greatly the fats and carbohydrates by means of a **High Protein Diet**; this rapidly improved the condition of the stools and controlled the intestinal flatulence and abdominal distension, and from personal experience of the disease the author could testify to the good effects of such a diet and to the immediate increase of the intestinal symptoms on taking more fats or carbohydrates. The liver extract produced a reticulocyte response in the typical cases with rapid improvement in the anæmia, and secondary anæmias also improved. When the total serum calcium was below 9 mgrm. per 100 c.c., **Calcium Lactate** and irradiated **Ergosterol** containing vitamin D were also given, and **HCl** was given when deficient in the gastric secretion. Over-fatigue and chills should be avoided.

J. B. Hance² regards sprue as differing only slightly from Addison's or pernicious anæmia with achlorhydria and intestinal and tongue infection by hæmolytic streptococci as described by Hurst in 1922. (L. Rogers in 1914 and in 1918 drew attention to the importance of streptococcal infections in sprue and their use as vaccines in its treatment.) In Kathiawar, where Hance worked, he suggests that sprue is accompanied by intestinal ulcers due to streptococci; but antecedent dysenteries, especially the amœbic form in his experience, greatly predispose to sprue, and in only 3 of 26 cases did he fail to isolate hæmolytic streptococci from the stools. He always found megalocytes in the blood and often normoblasts, and in 20 per cent of his cases he found paræsthesia of the extremities, indicating spinal-cord degeneration. In 60 per cent *E. histolytica* cysts were present in the stools, and 80 per cent gave a history of dysentery, but *Monilia psilosis* was not met with in any case. Hance therefore advocates streptococcal **Vaccines** together with **HCl** orally, and **Liver Extracts** for the anæmia, with **Blood Transfusion** in very severe cases. Only small doses, such as half a million streptococci, should be given, and they are followed by rapid disappearance of the soreness of the mouth and the anæmia, improvement in the stools, and gain in weight. P. Starr and L. Gardner³ also record biochemical studies in two sprue cases, and they noted that accompanying tetany was due to excessive calcium loss through the bowel and that the ingestion of large amounts of **Calcium** orally prevents fat diarrhœa.

B. K. Ashford¹ returns once more to *M. psilosis* in the etiology of sprue, and he now accepts *M. psilosis*, *M. parapsilosis*, and *M. krusei* as being found in the disease; but he rejects various other species described by Castellani, on the strength of very variable sugar tests. He still thinks that sprue is a nutritional unbalance on which *M. psilosis* infection is superimposed. In a further lengthy paper Ashford⁵ deals with sprue anæmia, and records charts illustrating the reticular response to liver extracts. G. C. Low and D. S. Dixon⁶ describe a case of cancer of the pancreas which was mistaken for sprue.

W. B. Porter and J. E. Rucker⁷ record two cases of non-tropical sprue in the United States which were treated successfully with **Liver Extract**, with improvement in the megaloblastic anæmia and in the intestinal symptoms. W. B. Glover⁸ reports a case of sprue in Costa Rica, where the disease is rare, and he records improvement after **Calcium Chloride** intravenously in doses of 1 to 3 c.c. at intervals of three to seven days up to twenty-five injections.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, Aug. 8, 131; ²*Ind. Med. Gaz.* 1930, March, 125; ³*Amer. Jour. Trop. Med.*, 1930, July, 283; ⁴*Jour. Amer. Med. Assoc.* 1929, Sept. 7, 762; ⁵*Arch. of Internal Med.* 1930, May, 647; ⁶*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, March, 525; ⁷*Amer. Jour. Med. Sci.* 1930, March, 310; ⁸*Brit. Med. Jour.* 1930, ii, 61.

STAPHYLOCOCCAL INFECTIONS. (See also KIDNEY, SURGICAL AFFECTIONS OF; PYOGENIC INFECTIONS; SKIN, PYOGENIC INFECTIONS OF.) J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—In an important discussion on this subject J. A. Ryle¹ states that staphylococcal fever, in which he includes the immediate febrile consequences and the metastases of a boil or carbuncle, is more particularly a disease of children and young adults. In children metastasis in bone leading to acute osteomyelitis is the usual sequel. In adults osteomyelitis is rare, and perinephritis or perinephric abscess is common. Metastases also occur in the prostate or in muscle without serious pyæmic manifestations. In graver cases with septicæmia multiple lung abscesses are common. The brain or a vertebra is a rarer site for a secondary abscess.

Staphylococcal infection of the skin, which includes the superficial follicular pustule, the boil, and sycosis coccigenica, is discussed by H. W. Barber,² and the renal forms of staphylococcal infection by J. L. Joyce³ and H. Barber.⁴ L. J. Witts⁵ reports two cases of *staphylococcal septicæmia complicating Addison's anemia*.

R. Y. Mathew⁶ reports four cases in children aged from 15 months to 4 years of *staphylococcus laryngitis* simulating laryngeal diphtheria. All underwent tracheotomy, but only one recovered. Diphtheria was excluded and the diagnosis of staphylococcus laryngitis established by the absence of response to diphtheria antitoxin and of membrane in the trachea, the high temperature, the failure to find diphtheria bacilli in cultures from the throat and tracheotomy tube, the repeated findings of *Staphylococcus aureus* in cultures, and growth of this organism from a patch of bronchopneumonia and pericardial fluid post mortem.

DIAGNOSIS.—According to Ryle¹ the diagnosis from streptococcal fever is made by the tendency to development of multiple abscesses, the absence of infection in joint cavities and other cavities lined by serous membranes, the absence of glossitis, diarrhoea, and progressive anæmia, the relatively slow pulse, and by blood culture. Staphylococcal infection may also be mistaken for pulmonary tuberculosis owing to the occurrence of hæmoptysis and profuse sweats, or typhoid fever owing to the prolonged initial fever without obvious metastases, but is distinguished therefrom by the sweats, the absence of rose spots, rarity of splenic enlargement, the leucocyte count, and blood culture.

PROGNOSIS.—The prognosis, according to Ryle, is not unfavourable in youth and with a good leucocytosis. The early appearance of a natural fixation abscess is a good sign.

TREATMENT.—This consists in rational medical and surgical procedures. Vaccine therapy and chemotherapy, according to Ryle, are best avoided.

REFERENCES.—¹*Guy's Hosp. Rep.* 1930, lxxx, 137; ²*Ibid.* 153; ³*Ibid.* 168; ⁴*Ibid.* 194; ⁵*Ibid.* 203; ⁶*Med. Jour. of Australia*, 1930, i, 34.

STERCOLITHS. (See RECTUM AND SIGMOID, STERCOLITHS OF.)

STERILIZATION, EUGENIC. (See EUGENIC STERILIZATION.)

STOKES-ADAMS SYNDROME. (See ARRHYTHMIA.)

STOMACH, SURGICAL DISEASES OF. (See also GASTRIC ANALYSIS; GASTRIC AND DUODENAL ULCER.) A. Rendle Short, M.D., F.R.C.S.

Gastroptosis.—O. Lambret,¹ of Lille, takes a serious view of the ill effects of this common condition. It leads to dragging on the bile-duct and the nerves in the lesser omentum, to inefficient and delayed emptying of the

stomach, dyspepsia, nausea, constipation, loss of flesh, and neurosis, on account of what he calls "destruction of the harmony of digestion". Medical treatment is uncertain and its effects are transient. The surgical treatment usually practised in France—Perthe's operation, whereby the lesser curvature is slung up by means of the round ligament of the liver—fails to prevent the descent of the greater curvature into the pelvis, and only relieves half the cases operated on. Lambret has therefore devised a new surgical procedure. After median laparotomy to explore the abdomen, he cuts a long strip of aponeurosis from the outer border of the anterior sheath of the left rectus. This strip is left attached at its upper end, but freed below. The rectus sheath having been sutured, the strip is carried through an intercostal space into the abdomen. It is then applied to the greater curvature of the stomach, from fundus to pylorus, and buried in a groove by oversewing with a continuous Lembert suture. At the pyloric end it is united to the round ligament of the liver, which is detached from the anterior abdominal wall for the purpose. He has operated on twenty-eight cases without mortality, and in all but one the clinical improvement has been most satisfactory. Barium skiagraphy shows that the ptosis of the stomach is efficiently corrected, and also that of the transverse colon; peristalsis takes place normally, and the emptying time is hastened.

Gastroptosis, of course, is generally but a part of a general visceroptosis, and the symptoms are due not merely to faulty position, but to a defect of tone. One hesitates, therefore, to add an artificial anatomical lesion to a physiological abnormality, but if ever the surgeon considers that in a particular case the sufferings are such that something must be done, and the relief afforded by rest, abdominal supports, and medical means is inadequate, Lambret's operation appeals to us as the best available at present.

Sarcoma of the Stomach.—D. C. Balfour² presents a study of 54 cases seen at the Mayo Clinic in twenty years, the condition being found at operation in all but one (autopsy case). The ratio of sarcoma to carcinoma was 1:111. The average age was 40, but no age was exempt. The symptoms were sometimes gastric in type, sometimes general abdominal, including epigastric pain or fullness, which might or might not be worse after food. In half the cases a lump could be felt. Loss of weight, vomiting, hæmatemesis, and melena were occasional symptoms. Free HCl was absent in one-third of the cases, normal or subnormal in the rest. Barium skiagraphy was usually interpreted as showing cancer of the stomach; in 5 patients it was negative. Most of the cases were thought to be carcinoma; two were correctly diagnosed before operation as sarcoma. In children a palpable growth known to be in the stomach may safely be regarded as sarcoma. The treatment is removal by operation, which was found possible in 36 cases, of which 12 are still living, mostly more than five years after. The usual method was the Polyá gastrectomy. Many of the cases were treated by **X Rays** after operation. Lympho-sarcoma responds well to radiation. **Coley's Fluid** was sometimes used also.

Cancer of the Stomach.—H. G. Zwerg³ found that, of 165 cases of cancer of the stomach attending the Königsberg clinic, only 44 were suitable for a radical operation with a hope of eradicating the disease. Of 42 cases coming within two months of the onset of pain, 23 were operable—that is, more than half.

H. Finsterer,^{4, 5} of Vienna, has contributed a number of papers embodying his latest statistics. He has operated on 535 cases of gastric carcinoma, whereof there were: 340 resections, 8 total extirpations, 88 gastrojejunostomies, and 99 exploratory laparotomies—that is, 65 per cent had a resection. He nearly always operates under a local anæsthetic, and prefers the Billroth II method

of partial gastrectomy. Of 211 simple resections, 13 died (6.1 per cent); of 129 complicated resections, 41 per cent died (involving colon, pancreas, etc.). Of 109 cases followed up, 50—that is to say, 25 per cent of those resected and 31 per cent of those discharged healed from the hospital—were found free from recurrence from five to eighteen years after. After a ten-year period, 14 per cent of those resected (17.4 per cent of those discharged healed) were alive and well. The older patients did just as well as the younger. The late results were better in primary cancer than in cases arising from a gastric ulcer.

REFERENCES.—¹*Presse méd.* 1929, Dec., 1613; ²*Surg. Gynecol. and Obst.* 1930, June, 948; ³*Munch. med. Woch.* 1929, Sept., 1590; ⁴53 *Tag d. deutsch. Ges. f. Chir.* Berlin, 1929; ⁵*Wien. klin. Woch.* 1929, Aug., 1125; Sept., 1157.

STREPTOCOCCAL INFECTIONS. (See PYOGENIC INFECTIONS; SKIN, PYOGENIC INFECTIONS OF.)

SUBARACHNOID HÆMORRHAGE. (See INTRACRANIAL HÆMORRHAGE.)

SUBPHRENIC ABSCESS.

A. Rendle Short, M.D., F.R.C.S.

T. H. Russell,¹ of New York, points out that the vast majority of these abscesses are found on the right side, and the organism is generally the *B. coli*. In a study of 24 cases, 6 each followed appendicitis and gall-bladder disease, and 4 were due to pneumonia or pleuritis; 2 followed trauma. The symptoms resemble those of chest trouble, with raised temperature, and sometimes pain in the region of the liver. Paralysis of the diaphragm occurs early. The chest dullness may be higher in front than behind, and the heart is not pushed across as in pleural effusion. The use of the aspirating needle is to be deprecated. The doming-up of the diaphragm may be shown by the X rays. The author recommends exploration, under a local or spinal anæsthetic, through the upper right rectus muscle to locate the abscess, and a counter-incision is made for drainage between the ribs in the most favourable position. If the abscess is opened by way of the anterior incision, the pus is to be sucked out by an aspirator, and through back-and-front drainage may be used. It is better not to resect ribs or to open the pleura. This makes for a high mortality.

REFERENCE.—¹*Ann. of Surg.* 1929, Aug., 238.

SUNLIGHT TREATMENT. (See PHOTOTHERAPY; TUBERCULOSIS, SURGICAL.)

SUPRARENAL GLANDS.

W. Langdon Brown, M.D., F.R.C.P.

G. Marañón¹ calls attention to encephalopathies in Addison's disease, tending to myoclonic convulsions, coma, and sudden death. The associated lesions at the necropsy have been parathyroid insufficiency, enlarged thymus, and hepatic insufficiency. Hypoglycæmia was present in 71 per cent and acidosis was very common. As might be expected, such patients are extremely sensitive to insulin. Metabolically Addison's disease is the converse of diabetes. In the latter the high blood-sugar provides something for insulin to work upon, in the former the low blood-sugar gives insulin no scope, and acidosis follows owing to incomplete combustion of the fats. An ample **Carbohydrate Diet** is, therefore, indicated in Addison's disease, and when hypoglycæmic symptoms are present 25 grm. of **Dextrose** should be given by the mouth (not by injection) three or four times daily. He recommends that 5 units of **Insulin** should be administered each time with the dextrose, but the risks of this procedure must be borne in mind. In this connection the reader is referred to the note on hyperinsulinism in the article on **ENDOCRINE TUMOURS**. When the influence of the vagus is considered, Addison's disease, by crippling the sympathetic,

must lead to a relative overaction of the vagus. The reviewer is clear that the clinical importance of low blood-sugar must be increasingly recognized. Low blood-sugar should be suspected in cases of migraine where the patient has a dislike for fats and a craving for sugar. (*See also* DIABETES.)

A. M. Shipley² reports a case of paroxysmal hypertension associated with tumour of the medulla of the suprarenal. The tumour was removed, with relief of symptoms. He refers to other examples of this rare condition, some of which were quoted in the MEDICAL ANNUAL for 1930 (p. 488). Vaquez and other French observers have frequently claimed that hyperplasia of the suprarenal medulla is a cause of hypertension, though this has been disputed. L. Langeron and R. Desplats³ boldly advocate **Radiotherapy** of the suprarenals for high tension and other vasomotor paroxysms.

Cortical Tumours.—Dingwall Fordyce⁴ reports two cases of virilism. One was in a girl of 2 who showed precocious sexual development due to an encapsulated tumour in the suprarenal cortex. She died twelve hours after operation, and metastases were found in the liver and brain. The other, also a girl of 2, had a large adrenal tumour successfully removed, with regression of the sexual precocity. K. Ismail⁵ reports a necropsy on a male child of 4 with hirsuties and precocious sexual development. There was a malignant tumour in the suprarenal cortex with metastases in the lungs. There was also a complete transposition of the viscera.

REFERENCES.—¹*Presse méd.* 1929, Aug. 7, 1021; ²*Ann. of Surg.* 1929, Oct., 742; ³*Presse méd.* 1930, Jan. 11, 49; ⁴*Quart. Jour. Med.* 1929, July, 557; ⁵*Presse méd.* 1930, March 1, 302.

SURGICAL TUBERCULOSIS. (*See* TUBERCULOSIS, SURGICAL.)

SWIMMING BATHS AND THE PUBLIC HEALTH.

G. E. Oates, M.D., M.R.C.P., D.P.H.

The number of public baths and swimming pools is increasing, and medical practitioners are frequently asked to give an opinion as to any possible danger to health which may result from swimming in public baths. In a Report to the Ministry of Health, E. A. S. Fawcett, H. T. Calvert, and J. A. Glover¹ summarize present knowledge as to the pollution and available means of purification of the water of swimming baths.

Pollution may be derived either from the persons of the bathers or from other sources. Under the latter heading come dirt from the boots of persons visiting the baths and the gross pollution derived from the costumes of the bathers. Not only the costumes, but also the towels, should be thoroughly washed and not merely dried before being used again. From the health point of view the most serious pollution is derived from the hair, skin, mucous membranes, and the urine of the bathers themselves. The bacterial flora of the water is abundant, and it is not difficult to recover and identify bacteria which are potentially pathogenic. The bacterial count is a fair index of the degree of contamination. The evidence that various diseases are occasionally, even though rarely, transmitted by the water in swimming baths appears convincing.

Various Conditions Transmitted by Public Baths.—The following are some of the diseases that may result from swimming in public baths:—

Gastro-intestinal Infections.—These are rarer than might appear likely, since very little water is swallowed.

Respiratory Infections.—Pneumonia may follow prolonged immersion, over-fatigue, and subsequent chilling. It is more likely to be due to a lowering of the resistance of the body of the bather to pneumococci which he is already carrying than to infection by virulent pneumococci actually conveyed by the water.

Skin Infections.—Furunculosis, scabies, ringworm, and pediculosis, when they occur, are more probably transmitted by towels and costumes than by the bath water. Furunculosis of the external ear is, however, due to auto-infection from the irritation of bath-water retained by cerumen and skin casts in the external ear. Epidermophytosis, or 'swimming-pool itch', is said to be very prevalent in the United States. The fungus specially affects the bases of the nails and between the toes. (*See also SKIN, FUNGUS INFECTIONS OF.*)

Conjunctivitis.—This may be osmotic or mechanical in origin. When occurring in epidemics, as it sometimes does, it is more likely to be due to infected towels than to the water.

Nasopharyngeal Infections.—It is conceivable that scarlet fever, diphtheria, and other infectious diseases may be transmitted by bath water. If traced to a swimming bath, it would be more reasonable, however, to suppose that any such disease had been contracted in the usual way by droplet infection from a carrier, under the conditions of overcrowding which frequently exist in the annexes of swimming baths.

Nasal Catarrh, Sinusitis, and Tonsillitis.—An attack may follow a visit to a swimming bath, but is just as likely to be an autogenous infection following mechanical irritation as infection from another sufferer. It is not uncommon for water to be forced into the maxillary antrum of a swimmer.

Otitis.—There can be no doubt that ear affections are often due to swimming. The causation of otitis media occurring in this way is not fully understood. Infection may be through the medium of the bath water. More probably the water acts as a mechanical agent, forcing pathogenic germs, such as hæmolytic streptococci, carried by the swimmer, into the cavity of the middle ear. W. I. Daggett and R. Cove-Smith,² in a discussion of this topic, urge the importance of acquiring a proper breathing technique during swimming. They draw attention to the special danger consequent upon sudden immersion by 'ducking', and point out the dangers resulting from persons suffering with colds, septic nasal conditions, perforated ear drums, or recurrent inflammatory conditions of the external auditory meatus, who visit a public bath. (*See also EAR, DISEASES OF.*)

Methods of Purification.—Natural purification can only be relied upon when a pool is of large extent and contains natural pond vegetation. In public baths the fill-and-empty system was in general use during the nineteenth century. If the water is changed frequently, as it should be, the cost of the water and the fuel for heating it is considerable. Fresh water always rapidly depreciates in quality when in use. The only satisfactory method of ensuring reasonable purity of swimming-bath water is to have a system of continuous and rapid filtration, combined with continuous chlorination and aeration, properly carried out with modern plant of adequate size. Only in this way can the water be kept clear, sparkling, and attractive in appearance and of a bacterial purity approximating to that of drinking-water.

REFERENCES.—¹*Report on Purification of Water of Swimming Baths*, 1929, H.M. Stationery Office; ²*Brit. Med. Jour.* 1929, ii, 296.

SYCOSIS BARBÆ. (*See SKIN, PYOGENIC INFECTIONS OF.*)

SYPHILIS.

Col. L. W. Harrison, D.S.O.

DIAGNOSIS.

Serum Tests.—The Health Organization of the League of Nations in August, 1930, took the opportunity offered by the presence in Copenhagen of a number of serologists attending the Eighth International Congress of Dermatologists and Syphilologists to hold a short laboratory conference at

the Serum Institute, Copenhagen, to compare a few of the tests which have come more prominently to the fore since the Laboratory Conference under the same auspices in 1928. The number of sera tested was only small, but the meeting served to demonstrate some important advances which have been made since 1928. In addition, the meeting drafted a communication to the International Congress of Dermatologists, of which the following is an extract¹ :—

"1. In order to secure the most reliable information to the clinician, at least two different sero-diagnostic methods should always be used. Even to-day the majority of research workers still hold it to be desirable that one of the methods used should be a Bordet-Wassermann test. On the other hand, and especially since the last Laboratory Conference, certain flocculation tests have been elaborated with such a high degree of sensitiveness and specificity that recourse should always be had to at least one of these tests; in all cases which prove difficult to judge, either serologically or clinically, several different highly sensitive flocculation tests should be used.

"2. In the interests of uniformity in the interpretation of the serological results of different Institutes, it should be pointed out—in repetition of the conclusions of the Laboratory Conference of 1928—that: only an unquestionably negative reaction should be reported as '—' or 'negative'; only an unquestionably positive reaction should be reported as '+' or 'positive'; all reactions which are neither unquestionably negative nor unquestionably positive should be reported as '±'. It is permissible, in the case of positive reactions, to add explanatory notes as to the degree of strength of the reactions."

As will be seen, the communication enumerates two principles of importance to all who are concerned with the use of serum tests, clinicians and serologists alike. The first is that each serum should be tested by at least two methods, the Bordet-Wassermann and a good flocculation, and the second that the result should be reported on a uniform plan.

To dispose first of the second of these principles, at present pathologists use a variety of methods by which to report their results: thus one uses a set of figures, e.g., 4300; another describes a positive as one in so many; and another's ++ means the same as still another's ±, or doubtful. The pathologist's immediate circle of clinicians experience no difficulty over the interpretation of his hieroglyphics, but the case is far different when a migrant patient—a merchant seaman, for example—presents his case record on which are results of serum tests recorded in the variety of ways employed by different pathologists. The same applies also to published articles in which results of tests are recorded. A uniform method of recording results, without prejudice to any explanatory remarks which any pathologist may wish to make on his reports, would abolish much of the existing confusion, and it is greatly to be hoped that the League of Nations' recommendation will be adopted universally.

The value of employing two tests may be illustrated by an example from the results obtained at the League's Laboratory Conference at Copenhagen in 1928. Here the method of the Wassermann test which gave the highest percentage of positive reactions in syphilis, but none in non-syphilitic cases, was that known as No. 1 Method, Medical Research Council, which is used in the Ministry of Health's special laboratory for comparing serum tests in this country. The reviewer's strong belief is that any more sensitive Wassermann than this affords false positives, and that the limit of delicacy has been reached in the Wassermann test. The two flocculation tests which proved most delicate were Kahn's and Müller's 'Ballungsreaktion'. The results of these three tests applied to the same sera were as shown in the

table below. It shows that, while the two flocculation tests gave only one falsely positive reaction between them, they declared considerably more sera of syphilitic persons to be positive than did the Wassermann—that is to say, they gave ocular demonstration that the patients providing these sera still harboured active syphilitic foci. It requires very little imagination to picture the effect on treatment of applying, in addition to the Wassermann, one of the tests mentioned, or one of equal quality, to every serum, because it is in treated cases that good flocculation tests show their greater delicacy. For diagnosis in the first instance (failing, of course, the finding of *Sp. pallida* in the lesions) one would still require a positive Wassermann, but later when one is testing the serum for the effect of treatment—perhaps deciding whether or not to stop treatment altogether—if a good flocculation test is employed, the clinician is less likely to be in a fool's paradise about his case than if he relies only on the Wassermann, as the table below shows quite clearly.

| METHOD | POSITIVE REACTIONS | |
|--------------------------------|--------------------------|-----------------------------|
| | In 496 Cases of Syphilis | In 429 Non-syphilitic Cases |
| Wassermann | 208 | 0 |
| Müller's 'Ballungsreaktion' .. | 314 | 1 |
| Kahn's | 303 | 0 |

The chief importance of all this is in the management of early syphilis when the patient is contagious, but when also there is a golden opportunity of eradicating the disease. If the patient in this stage is indifferently treated, he may quickly become non-contagious for the time being, but after suspension of treatment he is likely again to become contagious and really a greater danger to society than at first, since the fact is not usually disclosed by lesions on his skin or mucous membranes.

It is not unlikely that the arrest in the decline of syphilis which is apparent in official statistics may be due largely to the insufficient treatment given to a large proportion of early cases of syphilis; in fact, to a mere postponement of infectivity.

From the point of view of the patient, when the treatment is guided by a serum reaction which is not delicate he fares badly, because any relapse goes undetected for a number of months longer than if the test is the most delicate possible. In those months the disease becomes more and more firmly entrenched, and by the time it is detected it may have become ineradicable.

It is often argued that the good clinician is not deceived by a negative serum reaction after treatment, but proceeds with this, knowing that the first negative does not announce the death of the last spirochæte. But in practice the wariest clinician is subconsciously biased by the negative reaction. He may continue with treatment, but he may easily feel that, in this case, quite possibly he is 'flogging a dead horse', and, if any pressure is applied from the patient's side in the direction of reducing the programme, the clinician's resistance is less than if the serum reaction had been positive, e.g., after the first course. If such can happen when the patient is in the care of a practitioner who knows well the unreliability of the negative serum reaction after a course of treatment, it is easy to understand how indifferently must fare those under the care of practitioners who suspend treatment altogether, or at any rate the arsenobenzene element of it, when the serum reaction (often one by a

much less delicate method than No. 1, M.R.C.) is first reported as negative. If the specimens sent by such practitioners were tested also by a good flocculation method, the results would at least provide, in a far higher proportion of cases than at present, a strong stimulus to continuance of treatment, or for its resumption in cases where treatment has been suspended.

Three tests demonstrated at the Copenhagen meeting of serologists in August, 1930, show the success which has attended the efforts of certain serologists to simplify the technique whilst retaining or improving on the delicacy and specificity of their predecessors. They were Meinicke's 'Klärungsreaktion'² (see also MEDICAL ANNUAL, 1930, p. 503), Müller's test³ in an improved form, and Kline's slide precipitation test.⁴ From published articles relating to comparisons on many thousands of sera, each test appears to be as delicate as either of the two flocculation methods whose results are shown in the table already given.

B. S. Kline's test is carried out on a microscope slide of 3 in. by 2 in. dimensions on which have been formed twelve thin wax rings, each with an inside diameter of 13 mm. Two rings are used for the test of each serum, one for serum plus sensitive antigen emulsion, the other for serum plus very sensitive emulsion, so that one slide serves for the testing of six sera. After the mixtures of antigen emulsion and sera have been made in their respective rings, the slide (resting in a carrier which takes two slides, and with the carrier on a table) is rotated in the horizontal plane for four minutes, when the results are examined under a magnification of about a hundred. In a positive reaction the appearance is similar to that of an ordinary Widal's agglutination reaction. The test has been improved by purification of the antigen originally employed, the present antigen⁵ being free from various constituents said to be present in Kahn's antigen which tend to flocculate with non-syphilitic sera. With the extract two types of emulsion are made—one, which is very sensitive, by adding to 0.85 c.c. of distilled water, 1.25 c.c. of 1 per cent cholesterol, then 0.1 c.c. extract followed by 2.2 c.c. of 0.85 per cent physiological saline; and the other, which is less sensitive, by the same procedure with the exception of the cholesterol solution, the amount of which is 0.75 c.c. The emulsions remain stable for three days—a definite advantage.

Kline⁶ has also evolved a slide precipitation which can be carried out on whole blood obtained by a finger-prick. The blood so obtained is defibrinated by stirring with a spicule of wood (the flat end of a wooden toothpick), and 0.04 c.c. of it is pipetted into each of two wax rings on a slide similar to that mentioned above. For this test, around each thin wax ring is a thick one concentric with it and with a diameter of 2.9 cm. so as to form a moat for the purpose mentioned below. A drop of 7 per cent sodium chloride is added to each blood, and the slide is rotated in the horizontal plane for a minute. After this a drop of sensitive emulsion is allowed to fall into one inner ring, and one of very sensitive emulsion into the other, and the slide is rotated for four minutes. In order to read the results it is necessary to lake the blood with water, and to make this possible the moat mentioned above has previously been formed so that when 1.5 c.c. of distilled water is added to the blood-emulsion mixture it overflows the inner ring, but is confined by the outer. The slide is rotated for a minute, and allowed to stand for ten to fifteen minutes before the results are read under the microscope. This test is in routine use in the author's laboratory for the blood of each transfusion donor, the result being ready by the time the suitability of the blood has been determined from the point of view of 'type'. As it is conducted with very sensitive antigen emulsion, and the Kline test has proved at least equal in delicacy to the most sensitive, the risk of transfusion of syphilitic blood is reduced to a minimum.

From this brief sketch illustrating the advances which have been made in simplification it will be seen that we are appreciably nearer to the time when a serum test for syphilis will be routine in every medical examination.

M. Stern and F. Toni⁷ have compared the Wassermann (W.R.), Meinicke Turbidity (M.T.R.), Meinicke Clearing (M.K.R.), Sachs-Georgi's Lentochoh (S-G.R.), Sachs and Witebsky's Citochoh (see MEDICAL ANNUAL, 1930, p. 502), and Müller's Coagulation (M.B.R.) tests on over 2000 sera, and conclude that the best combination of two tests which will afford the highest percentage of positive reactions in syphilis and the fewest false positives is the W.R. with the M.K.R. or perhaps M.B.R. II.

EXPERIMENTAL SYPHILIS.

B. Albrecht⁸ has demonstrated that doe rabbits can be infected by lightly smearing the virus on the genitals, and that symptomless rabbits can transmit syphilis by intercourse. Out of 32 rabbit does in which syphilitic virus was lightly smeared on the genitals, some developed chancres (occasionally after very long incubation periods), but in 8 no sign appeared in periods varying from 315 to 676 days. In 6 cases inoculation of gland material from these rabbits into testes of bucks produced chancres. In another series, does which had remained, or become, symptomless after various methods of inoculation were mated with healthy bucks. One buck developed a chancre on the penis 205 days after intercourse with a doe which (after suffering from generalized syphilis) had been symptomless for 169 days. Another buck developed a symptomless infection from a doe which had been symptomless for 169 days following generalized symptoms. In a third case a buck paired with a doe which had shown no sign after smear infection of the vagina was also symptomless and its glands were non-infectious 219 days after coitus. A doe, however, with which this buck was paired 27 days after coitus with the first developed a symptomless infection. A buck which had been symptomless for 36 days after treatment was paired with a healthy doe, which remained symptomless for 231 days. This doe's glands were, however, infectious. The author suggests that similar results may occur in man.

Experimental Tests of Prophylactic Disinfectants.—E. Zurchelle⁹ carried out experiments on animals to determine whether or not it would be a good thing to set up in Bonn automatic machines selling a prophylactic ointment called 'Dublosan', which contains quinine mercury bisulphate. The preparation, which is put up in tubes, was applied to rabbits two, four, six, eight, and ten minutes respectively after inoculation with *Sp. pallida* (Nichol's strain) by deep scarification. Chancres appeared in the animals treated two, six, eight, and ten minutes after inoculation; in the first of these the chancre did not appear until four and a half months later. These unsatisfactory results led to experiments with other well-known prophylactic ointments. Pure white vaseline failed; 1 per cent perchloride of mercury in lanolin and 33½ per cent quinine in lanolin and vaseline also failed even when applied immediately. The experience with the quinine preparation confirmed that of Worms, who applied it three and fifteen minutes after inoculation. Experiments with 33½ per cent calomel ointment were difficult owing to the high mortality of the rabbits from mercury poisoning, but the author found no preventive effect of application more than eight minutes after inoculation. Worms had found protection only in rabbits treated within fifteen minutes. An ointment containing 1 per cent mercury oxycyanide was found to be more successful, but the author thinks this may have been only accidental. In another series of experiments an area was scarified and chancre material rubbed into it for fifteen seconds on the following day. Dublosan was applied

for half a minute before and after this inoculation. Of the four animals, three died and one developed a chancre. The author concludes from his experiments that ointments containing disinfectants certainly exercise some destructive action on the virus and produce some suppression of chancres. But the spirochaetes are so active that they very quickly get out of reach, and although the experiments do not indicate that local prophylaxis as employed in the Army and Navy is useless, they do show that its value should not be overestimated.

SYPHILIS AND CANCER.

G. H. Belote¹⁰ (Ann Arbor, U.S.A.) has studied the incidence of syphilis in cases of cancer of the tongue and found serological evidence of it in 29.3 per cent of 92 cases. In all cases of cancer the percentage of positive reactions was 7.2, and in all cases admitted to hospital it was 5.

H. J. B. Fry¹¹ compared the serum reactions in 1000 unselected cases of cancer treated in the Cancer Hospital, London, with those in patients attending the hospital but found to have diseases other than malignant. The percentage of positive reactions in the malignant cases was 9.7, and that in the controls was 13.2. In 535 cases of malignant disease affecting parts other than the buccal cavity the percentage was 6.2. The percentage of positive reactions in cancer of the tongue was 35, and if the 4 female cases are excluded from the series of 80, the percentage in the remaining 76 male cases was 36.8. The author did not find such a great disproportion between the two sexes in respect of syphilis of the tongue as in cancer, and concluded that an additional factor (possibly smoking) accounted for the high incidence of cancer in syphilitic tongues.

Other noteworthy percentages were: lips, 29.4, all males (compares with 21.4 per cent found by Simmons and Daland); jaw, 20.8, with only a small preponderance in males; combined bucco-labio-pharyngeal figures, 25.4 (compares with 35 per cent found by Roussy and Bertillon and 16 per cent by Simmons); cervix uteri, 13.3 (compares with 6.8 per cent found by Martzloff). The author concluded:—

“1. There is a lower percentage of positive Wassermanns in cases of malignant disease than in a similar population of non-malignant cases. If buccal cancers are excluded, the percentage is half that in non-malignant cases.

“2. Cancer of the tongue and buccal cavity, in which a high percentage of positive Wassermanns is found, is almost confined to males and is probably due less to syphilitic infection than to some factor such as smoking.

“3. There is a low percentage of syphilis in cancer of the digestive tract, except in cases of cancer of the stomach, and the incidence diminishes from mouth to anus.

“4. Syphilis does not appear to be a factor of importance in cancer of the glandular organs, nor, apart from the lip, in the production of cutaneous cancer.

“5. In general, from the above figures there is no evidence that syphilis plays any direct or very important part in the production of cancer.”

THE LIVER IN ACTIVE SYPHILIS.

By means of the Van den Bergh test S. Irgang and A. M. Sala¹² found evidence of hepatic involvement in 25 per cent of 179 cases of untreated syphilis with skin lesions. Dividing the cases into primary, secondary, and tertiary, 4 out of 11 primary, 17 per cent of the secondary, and 24 per cent of the tertiary gave positive reactions. None of the cases presented symptoms which could be interpreted as hepatic. Of 134 negative cases, 12 per cent became positive

though none became jaundiced under treatment; of 20 initially positive cases, 2 became jaundiced after four to eight injections. The figures afford positive evidence of the frequency with which the liver is affected in all stages of syphilis.

TREATMENT.

Arsenobenzene Resistance.—J. Nicolas, J. Lacassagne, and R. Froment¹³ have reviewed the vexed question of the development of strains of *Sp. pallida* which are resistant to arsenobenzene. They relate from their own and published experience cases illustrating the various ways in which treatment with '914' has failed either completely or partially to control the manifestations of early syphilis, dividing the cases into different classes, e.g., (1) Those in which the early symptoms rapidly disappear under the first course of treatment, but reappear very shortly after; (2) Cases in which the treatment seems to have no effect, new symptoms appearing even during its administration; (3) Cases in which the lesions are affected only by the higher doses (0.9 grm.), and then only partially; (4) Latent cases which develop active signs under the treatment. The cases related by the authors were treated at first solely with '914' in doses which were adequate, frequently reaching 0.9 grm. As to the cause of the unresponsiveness to treatment, one may blame the spirochaete, the patient, or the remedy. As regards the remedy, it may be that the '914' of to-day is not so potent as that of some years ago. The authors remark on the possibility that, in diminishing the toxicity for the patient, the makers may have reduced it for the parasite. [This question was raised in this country in 1922 by the Salvarsan Committee of the Medical Research Council, and the subsequent investigations by H. H. Dale and C. F. White¹⁴ discovered that certain brands of '914' were decidedly inferior in parasitotropic power. The result was the institution of a therapeutic test which is a safeguard against the issue in this country of batches of arsenobenzene compounds of inferior therapeutic efficacy.—L. W. H.] The decision as to the responsibility of the parasite or of the patient is difficult. The authors report some cases in which both partners in a syphilitic infection were unresponsive to treatment, suggesting that they had been infected with a resistant strain. [The authors mention four such cases, and say that in the literature they have found a number of similar ones; but one would imagine that, if the cases of this kind discovered in various parts of the world had been due to resistant strains, these would quickly have been spread to large numbers of the population, and arsenic-resistant cases would not be numbered in fours and fives but in thousands.—L. W. H.] So far as the soil is concerned, in a number of cases of intractability the partner has been found to be normally responsive to treatment, indicating that some constitutional defect of the patient was responsible.

J. E. Moore and H. H. Robinson¹⁵ have investigated the question of arsenobenzene-resistant syphilis in their own clinic, where much the same form of treatment has been practised since 1914. Comparing the serological response in early syphilis to the first course of treatment in the period 1914–23 with that in the period from 1925–7, they have found no difference, and the same applies to clinical relapses. They conclude, therefore, that there is no evidence of an increase in arsenobenzene-resistance in Baltimore.

Prevention of Arsenical Dermatitis.—One of the bugbears of arsenobenzene treatment is the risk of the patient's developing exfoliative dermatitis, from which he may die, or be incapacitated for many weeks. In the best event the complication puts a stop, at least temporarily, to the administration of arsenobenzene treatment and so constitutes a serious obstacle to the attainment of a cure. Further, in patients who have shown signs of skin sensitiveness in this way, however mild, the resumption of arsenobenzene treatment

even many months later is always a matter of great anxiety, with the result that in most cases none is given. It would be a great boon if one could detect with reasonable certainty the hypersensitive patient before commencing treatment, and could also know those factors in treatment which are responsible for the development of dermatitis. As regards the detection of hypersensitiveness, A. G. Schoch¹⁶ suggests the following test: A small piece of linen soaked in a 1-3 solution of '914' is laid on the arm, covered with protective, and fastened in position with adhesive. In a hypersensitive patient a patch of dermatitis corresponding to the area of the linen appears twenty-four hours later. Of 100 patients to whom this test was applied, 4 gave positive reactions; all of these had suffered from arsenical dermatitis from four to seventeen months previously. Of the remaining 96 patients, 50 were syphilitic and had tolerated arsenobenzene injections normally. A possible risk of a test for hypersensitiveness is that it may initiate this condition, but the author has found no evidence in the literature of such a result following a test by this 'percutaneous' method.

Other methods of testing are the scratch method (application of 1-1000 solution of an arsenobenzene preparation to a scarified area), which was employed by Klauder, and the intradermal. The scratch method has not been used to any great extent, but W. Frei¹⁷ and M. B. Sulzberger¹⁸ made a number of experiments which seem applicable to the problem in man. Frei sensitized 8 out of 66 normal persons by intradermal injection of approximately $\frac{1}{2}$ mgrm. '914', and Sulzberger showed that guinea-pigs could be sensitized by a similar procedure. The practical inference from this is that the accidental deposit of even a minute dose of an arsenobenzene preparation in the skin during an injection may sensitize the patient and eventually lead to a generalized dermatitis. J. V. Klauder¹⁹ and others, including R. L. Mayer,²⁰ have drawn attention to the frequency of dermatitis after the vein has been missed and the tissues have been infiltrated with the drug. A method of neutralizing the result of such an accident is suggested by Sulzberger's experiments. She found that, if a dose of '914' was introduced directly into the circulation within twenty-four hours of an intradermal injection, but not later, the animal was desensitized. The practical application of this in the case where the vein has been missed and the tissues have been infiltrated is immediately to inject a full dose into another vein. [It seems possible, considering the smallness of the sensitizing dose, that the introduction through the skin of a needle soiled externally with solutions of an arsenobenzene preparation, or, in an intramuscular injection, the regurgitation of some of the solution along the needle track into the skin, may sometimes sensitize.—L. W. H.]

Treatment by Tellurium.—A. D. Frazer²¹ reports on the treatment of seven cases of 'Wassermann-fast' syphilis with 5 per cent tellurium suspended in glucose, the individual dose being 0.5 to 1 c.c., the intervals five to seven days, and the total dose about 5 c.c. The average duration of the infection was nineteen years, and all had received considerable treatment previously with no effect on the serum reactions. After the tellurium course the serum reactions of four patients were weakened to negative or doubtful. No important toxic effect was noted, but a great disadvantage of the treatment was that it made the patients smell strongly of garlic, and a faint odour was perceptible even six to eight months after the last injection.

Pyrotherapy.—The literature, already vast, testifying to the value of malarial treatment in various intractable forms of syphilis continues to grow with great rapidity. Of more immediate interest than these papers are some on substitutes for malaria which are more convenient and safer. K. Schroeder's²² further experience with **Sulfosin**—a 1 per cent solution, or suspension, of

sulphur sublimatum subtilissimum in olive oil—has strengthened his view that injections of this preparation are a very efficient substitute for malaria in the treatment of various forms of syphilis. N. G. Harris²³ agrees that sulfosin treatment is useful and worthy of trial by any practitioner.

F. Pollak²⁴ has given **Colloidal Sulphur** intramuscularly in doses of 1 to 2 c.c., at intervals of two to four days, to a total of 10 or 12 c.c. A rise of temperature eventually to 104° followed each injection and was maintained for four or five hours. The results in nine cases of parasyphilis appear to have been good, and the author concludes that they compare favourably with those of malarial therapy.

P. A. O'Leary and L. A. Brunsting²⁵ in a progress report on fever treatment of neurosyphilis think that, if anti-typhoid injections are given, the series of paroxysms should be longer (20 to 25) than in malarial treatment.

Beume²⁶ reports a case which suggests that **Autohæmotherapy** may be a useful adjuvant to the treatment of syphilis. The patient had had four courses of arsenobenzene, mercury, and bismuth, and eight '914', with twelve bismogenol in a fifth course which had not influenced a tertiary skin lesion, when he had an accident which resulted in hæmatomata of the knee- and ankle-joints. On discharge from hospital four weeks later all syphilitic lesions had disappeared and the Wassermann reaction had become negative. [This case recalls one several years ago in the experience of the reviewer, in which a patient with an old-standing syphilitic infection with a strongly positive Wassermann reaction developed a large hæmatoma in the buttock as a result of the fourth intramuscular injection of mercury (he was intolerant of '914' and had received only two small doses of it). On recovery from the accident some weeks later his Wassermann reaction was quite negative.—L. W. H.]

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SYPHILIS, CARDIAC. (See HEART DISEASE, SYPHILITIC.)

TABES DORSALIS.

Macdonald Critchley, M.D.

PATHOGENESIS.—The site and nature of the initial lesion in tabes dorsalis constitute one of the most baffling problems in neuropathology. In recent years the Redlich-Nageotte theory of a primary inflammatory process in the extramedullary posterior roots (= the 'radicular nerve') has been modified by Richter,¹ who described a specific type of granulation tissue. This hypothesis has become the most popular and is widely quoted. Richter believes that the first and essential lesion in tabes is the settling of spirochætes in the radicular nerves, where a reactionary granulation tissue develops. This increases and finally strangulates the nerve-fibres. G. B. Hassin² believes, however, that strangulation of the radicular nerve is effected by retention of the tissue fluids in the spinal cord, due to proliferating arachnoidal cells. The recent work of R. O. Stern³ demonstrates the basic fallacy of both Richter's and Hassin's views. Cells of the so-called specific granulation tissue were found not to be

peculiar to tabes, being present in 22 out of 27 control cases. Moreover, intramedullary posterior root degeneration may be visible as early as three months after the onset of symptoms, while posterior column changes were demonstrable as early as eighteen months. Stern makes the very important though tentative suggestion that degeneration of the posterior columns may result from toxins draining from some peripheral focus, most probably the aorta. Carey Coombs,¹ however, points out that the incubation period of the tabetic lesion is shorter than that of the aortic, and queries whether there might not be some common reservoir of poison from which both spinal and aortic lesions are initiated. He suggests that the mediastinal lymph-glands might constitute this source of toxin.

Charcot's Arthropathy.—U. J. Wile and M. G. Butler⁵ have made an interesting survey of a large number of instances of Charcot joint affections associated with tabes. From a study of their series of 88 cases, certain etiological and symptomatological generalizations emerged. In the vast majority of cases the age of onset lay between 35 and 55. Males outnumbered females in the proportion of two to one; but, in view of the relative rarity of tabes in the female, it happens that Charcot arthropathies were commoner among female tabetics. The onset of symptoms was usually gradual, although Charcot taught otherwise. Knees, ankle, spine, hip, and shoulder—in this order—were the commonest joints to be affected. When the small joints were involved the affection was usually polyarticular; this occurred in 28 per cent. A positive Wassermann reaction together with abnormal neurological signs occurred in 56 per cent. In 2 out of the 88 cases there was no clinical or serological evidence of syphilis (one of these was a child with spina bifida). The tabetic process appeared to be stationary or arrested in a large number. Few complained of root pains, visceral crises, or optic atrophy, and surprisingly few sought treatment on account of neurological symptoms. Where specific inquiry was made a history of trauma was obtained in 24 per cent. In another 7 cases the arthropathy followed an acute arthritis. The authors believe that injury is not such an important etiological factor as are faulty posture, ataxia, and hypotonus.

Important contributions to the pathogenesis of Charcot's arthropathies have recently appeared. M. Faure-Beaulieu, E. Bernard, and C. Brun⁶ found in the vicinity of the joints, in two cases, glandular swellings which biopsy showed to be syphilomata. Spirochaetes were demonstrable in one. These findings would seem to support the conception of Barré,⁷ who sees in Charcot's joints the results of syphilitic inflammation of the nutrient vessels of the affected bones and articulations. H. Oberthur⁸ also is dissatisfied with the trophic conception of Charcot's arthropathies and quotes the findings of P. Delbet and P. Cartier,⁹ who demonstrated organisms in the synovial fluid of such cases. The bacterium was inconstant in identity; at times a diplococcus was found, at others the tubercle bacillus. Oberthur suggests that Charcot's arthropathy is an infective arthritis to which tabes gives a particular *allure*; he tentatively hypothesizes a urinary origin for the infection.

Juvenile Tabes.—The occurrence of tabes in association with hereditary syphilis must be conceded as an extreme rarity. Whereas in the acquired forms cases of tabes outnumber those of general paralysis, the reverse holds true for congenital neurosyphilis. In both types, transition cases labelled 'taboparesis' are common, but appear to be more frequent in the hereditary forms. Early monographs on the symptomatology of juvenile tabes are those of Hirtz and Lemaire¹⁰ (1905) and of Jones¹¹ (1908). F. R. Ferguson and M. Critchley¹² have recently collected a series of cases of congenital neurosyphilis, which included 8 cases of tabes, 12 of taboparesis, and 15 of general paralysis

of the insane. Analysis of the tabetic group reveals that, although every manifestation of the disease may be observed in the juvenile forms, nevertheless there are certain points of differentiation regarding the relative frequency of the clinical manifestations. According to the authors' experience, the main features of the juvenile forms of tabes are as follows: (1) Onset at or about 17, with extremes of 10 and 24. (2) Males and females equally affected. (3) Failing vision and paræsthesiæ are the commonest initial symptoms; severe lightning pains and ataxia are rare. There was no example of visceral crises among their cases. (4) Headache, photophobia, and diplopia are common later symptoms, while sphincter disturbances are unusual. (5) No psychological abnormality occurred other than slight mental dulling. (6) Sensory loss and ataxia are slight compared with adult findings. (7) Typical pupillary changes occur, frequently in association with dilated pupils: nystagmus was observed in three cases. (8) Trophic disorders are very uncommon; Charcot's arthropathies have been recorded a few times, but there is no instance in the literature of perforating ulcer in juvenile tabes. (9) Optic atrophy is a common physical sign; strabismus is present in half the cases. (10) Although in adult cases of tabes manifestations of cutaneous or visceral syphilis are slight, in the juvenile forms there may be numerous stigmata of congenital lues.

REFERENCES.—¹*Zeits. f. d. g. Neurol. u. Psychiat.* 1921, xlvii, 1; *Arch. f. Psychiat.* 1922, lxxvii, 296; 1923, lxx, 529; 1924, lxxii, 318; ²*Arch. of Neurol. and Psychiat.* 1929, xxi, 311; ³*Brain*, 1929, lli, 295; ⁴Lundieian Lectures, *Lancet*, 1930, ii, 227; ⁵*Jour. Amer. Med. Assoc.* 1930, April 5, 1053; ⁶*Presse méd.* 1930, April 2, 455; ⁷*Thèse de Paris*, 1912; ⁸*Rev. de Chir.* 1929, No. 4, 304; ⁹*Bull. Acad. Méd. de Paris*, 1929, March 19, 387; ¹⁰*Rev. neurol.* 1905, xiii, 265; ¹¹*Brit. Jour. Child. Dis.* 1908, v, 131; ¹²*Ibid.* 1930, xxvii, 1.

TACHYCARDIA. (See ARRHYTHMIA.)

TALIPES. (See FOOT, SURGERY OF.)

TEETH. (See DENTAL CARIES AND PYORRHOEA ALVEOLARIS; DENTAL SEPSIS; DENTISTRY, CHILDREN'S; DENTISTRY, RADIOGRAPHY IN; DENTISTRY AND RADIUM; GINGIVITIS, HYPERTROPHIC; ORAL SURGERY.)

TENDON AND TENDON-SHEATHS, INJURIES AND DISEASES OF.

E. W. Hey Groves, M.S., F.R.C.S.

Injuries of the tendons of the hand are common, and when they are due to blunt violence they are often regarded as trivial, the treatment being consequently neglected. Any sharp blow on the back of the fingers when the interphalangeal joints are flexed is liable to cause rupture of the extensor tendon. This leaves a permanent weakness and deformity. M. L. Mason¹ gives a detailed account of the anatomy and varieties of this type of injury. In its commonest form the terminal interphalangeal joint is affected, generally in the middle finger. In America the accident is usually caused by a blow on the back of the flexed finger whilst playing baseball; the resulting deformity is known as 'the baseball finger'. The terminal phalanx remains partially flexed (*Plate LIX, A*), and although it can be straightened passively, the patient cannot do this by his own muscular action.

When the thin expansion of the extensor tendon where it blends partly with the capsule of the joint and is inserted into the terminal phalanx has been ruptured, there are two possible lines of treatment—either by a splint or by open operation. Any simple kind of splint which secures hyperextension of the finger will serve, and that designed by Lewin is neat and effective (*Plate LIX, B*);

PLATE LIX

RUPTURE OF TENDONS OF HAND

(M. L. MASON)



Fig. A.

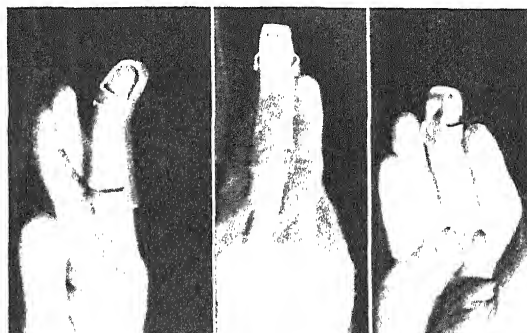


Fig. B.

Fig. A.—Typical deformity resulting from rupture of the extensor tendon insertion into the distal phalanx. The actively extended finger was caught in a garage door in such a fashion that the interphalangeal joints were forcibly flexed.

Fig. B.—The Lewin splint for 'baseball finger', i.e., rupture of extensor tendon over the distal phalanx. The splint may be used immediately after the injury or after operative repair. It holds the joint in hyperextension—an important point, since the tendon is likely to heal in lengthened position.

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but for rapid and complete recovery open operation is more satisfactory. Mason advises that this should be done by an L-shaped incision passing across the root of the nail and down the side of the finger. The torn capsule and tendon are sutured and the finger is put up on a palmar splint. A less common but more serious type of tendon rupture is that which affects the extensor tendon as it crosses the middle interphalangeal joint. At this point the extensor tendon consists of three strips, a median and two lateral. The rupture usually affects the middle tendinous strip, and the joint becomes buttonholed between the two lateral strips. The terminal interphalangeal joint becomes extended whilst the middle one is flexed. In this kind of injury it is even more imperative to do an immediate operation than in that affecting the last joint. Of the tendons about the wrist, there is only one which is liable to injury by blunt violence, and that is the long extensor tendon of the thumb. This may be torn in any fracture of the lower end of the radius, or it may be ruptured spontaneously by the action of a drummer in holding his drumstick, so that in Germany it is known as 'the drummer's thumb'. There may be some difficulty in the operative repair of the injury, owing to the fact that the torn ends of the tendon are so thin and frayed. One of two alternative methods may be used: (1) Another tendon, e.g., the extensor carpi radialis longior, can be substituted for the proximal part of the long thumb extensor; or (2) A free tendon transplant may be inserted, taking a piece of the palmaris longus tendon and replacing by this the torn part of the thumb extensor.

The tendons and their sheaths are liable to be affected by various kinds of new growths, the commonest of these being giant-celled myeloma and fibroma. But M. S. Burman and J. E. Milgram² have described six cases of a much rarer form of tendon tumour—a hæmangioma—and have found other cases in the literature. In the cases they describe the tendons affected were those round the ankle, knee, and wrist. In all cases except one the tumour was localized and showed no sign of recurrence after excision. It appears to start in the tendon-sheath and from there to invade the tendon itself. In one case affecting the wrist it was much more diffuse, and after removal recurred higher up in the forearm, strongly suggesting an endothelioma with local malignancy. It is very unlikely that the nature of this rare tumour will be recognized before operation, but in several of the cases reported there occurred a nævus of the skin over the tumour which might have given a hint as to the nature of the underlying growth.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1930, March, 611; ²*Ibid.* Feb., 397.

TESTICLE AND SCROTUM, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

Cryptorchidism.—B. H. Hughes¹ emphasizes the distinction that must be drawn between true cryptorchidism, in which an underdeveloped or empty scrotum, unilateral or bilateral, is associated with the imperfectly descended testicle, and false cryptorchidism, in which one or both testicles may be in the inguinal canal or even within the internal abdominal ring, and yet the scrotum shows a perfect state of development. In the latter type of case, if the patient is placed in a hot bath or if an anæsthetic is administered, the testes readily descend into the scrotum. False cryptorchidism is due to an overactivity of the cremaster muscle, and such a condition is to be seen in the hedgehog, whose testes occupy their scrotal habitat during the rutting season only. The writer describes his technique of **Orchidopexy**, which, in brief, consists in mobilization of the undescended organ, which involves cutting the spermatic vessels and bringing the testicle through an incision in the scrotum into a subcutaneous bed made for it on the inner aspect of the thigh. In this bed a collateral circulation is

developed, as is seen by the free hæmorrhage which occurs when at the end of two months or later the scrotum is freed from the thigh and the testis removed from its crural bed and replaced in the scrotum. In bilateral cases the double operation is performed at an interval of three weeks. The writer has followed this procedure in over thirty cases and has been very satisfied with his results.

Dislocation of Testis.—E. P. Alyea² states that traumatic dislocation of the testicle is far less common than cryptorchidism or aberrant migration of the gland. The resulting position of the dislocated testicle depends upon the force and direction of the blow, the presence of anatomical anomalies, and the presence or absence of obstruction. Three groups are recognized: (1) The superficial or subcutaneous dislocation, which may be superficial, inguinal, pubic, penile, perineal, or crural; (2) The internal dislocation, in which the testis passes within the external inguinal ring and which may be inguinal, femoral, or abdominal in type; and, finally, (3) The compound dislocation, in which the organ is extruded through a wound in the scrotal skin. Since the year 1800 the literature has yielded, so far as the author has been able to ascertain, only 23 original cases of traumatic dislocation of the testicle. The number of cases belonging to each type was: pubic 6, superficial inguinal 5, penile 3, perineal 2, in the inguinal canal 3, and compound dislocation 3. There are no authentic reports of a traumatic femoral, crural, or abdominal testis. The writer describes in detail a case of his own which he believes to be one of traumatic crural dislocation of the testis and which was reduced by open operation. Another personal case is reported of compound dislocation of the testicle, and he is of opinion that, although only three cases have so far been reported, this is probably a rather common industrial accident. The etiological factor in the majority of cases of testicular dislocation is the passage of a wheel over the genital region, and, although early diagnosis is often difficult, it is usually easy after traumatic swelling has disappeared, and the prognosis is good in that treatment is usually very satisfactory. Of the 25 cases noted in this paper, reduction without open operation was accomplished in only 3 cases, open reduction in 16, and 6 cases were not treated.

Undescended Testis.—A. D. Bevan³ reports in detail his operation for this condition. Experience is leading him to operate upon these cases earlier, and his opinion now is that they should be dealt with as soon as possible after the child is a year old, provided he is in good general condition. Although the structures are very small and the tissues very delicate—for which reason especially small artery and tissue forceps and very fine catgut should be used—there are definite advantages in doing the operation at this early age. The structures are more pliable and yielding, the cord is more easily lengthened so that the organ can be brought down without tension, there is less danger of doing sufficient injury to cut off the blood-supply, and finally, in the writer's opinion, there is a better chance of subsequent normal development occurring.

Hydrocele.—M. B. Wesson¹ analyses 30 cases of so-called 'traumatic hydrocele'. He found that 17 were due to chronic prostatitis and vesiculitis, 3 to chronic irritation—e.g., horseback riding—1 to sarcoma, 1 followed herniotomy, 3 were associated with tuberculous epididymitis, 1 with cryptorchidism, 1 proved to be a hæmatocele, and in 3 the cause could not be determined. In no case was there a clear history of traumatism except, perhaps, that which proved to be a hæmatocele. The writer states that nowadays expedience and economic factors tend to encourage the 'industrial' doctor to ignore fundamental underlying infections and unduly to emphasize strains and bruises whenever a workman complains of a sore back, a swollen testicle, or even a gonorrhœal urethritis.

St. G. B. D. Gray⁵ recommends the treatment of hydrocele by means of injections of **Morestin's Fluid**, a mixture of equal parts of carbolic acid, glycerin,

and alcohol, using from 2 to 4 c.c., which is injected very slowly after almost completely emptying the hydrocele of its contents. [Tapping and injection of hydrocele was the common method of radical treatment up to about twenty years ago, when it was abandoned for operative treatment. The objections to the method at that time were that obliteration of the sac might be partial and that excessive reaction might occur.—J. T.-W.]

Testicular Neoplasms.—B. S. Barringer, F. W. Stewart, and J. W. Spies⁶ state that up to the end of 1928, 150 cases of testicular neoplasm have been observed at the New York Memorial Hospital. In 42 of these cases the testis was removed either before or after irradiation at this or another hospital, and a pathological examination made. Their present report deals with these 42 cases thus verified: 24 cases of embryonal carcinoma and 1 of lymphosarcoma were found to be radiosensitive; 10 cases of embryonal adenocarcinoma and embryonal adenoma malignum and 3 cases of embryonal myosarcoma were found to be moderately radiosensitive; 3 cases of carcinoma of the adult type of tubule origin and 1 case of squamous carcinoma were found to be radio-resistant. The writers therefore conclude that the embryonal anaplastic carcinomata react like highly radiosensitive tumours, the embryonal adenocarcinomata with well-formed glandular structures are considerably less sensitive, and the other tumours already noted are quite radioresistant. It might be concluded that from the reaction of the primary testicular tumour some indication as to its type might be obtained. This is true only to a certain extent, for other factors must be considered, since in an adult cystic teratoma with embryonal elements capable of metastasis the irradiation may completely destroy the more active cellular portions and yet leave the adult structures relatively unaltered. One would therefore be mistaken in thinking that the treatment was without effect, whereas, as a matter of fact, it had accomplished its purpose. In one other cellular tumour with many features justifying the diagnosis of choriocarcinoma testis, the irradiation almost entirely destroyed the local tumour, yet the testicular mass remained for several weeks unaltered owing to thrombosis and infarction of the tumour vessels, which practically converted the tumour mass into a hæmatoma which, of course, did not diminish under irradiation. (*See also ENDOCRINE TUMOURS.*)

REFERENCES.—¹*Clinical Jour.* 1929, Sept. 18, 451; ²*Surg. Gynecol. and Obst.* 1929, Nov., 600; ³*Ann. of Surg.* 1929, Nov., 847; ⁴*California and West. Med.* 1929, Aug., 127; ⁵*Brit. Med. Jour.* 1930, i, 649; ⁶*Ann. of Surg.* 1930, Jan., 115.

TETANY. (*See PARATHYROID GLANDS.*)

THORACIC SURGERY. (*See EMPYEMA; HEART AND PERICARDIUM, SURGERY OF; LUNG, ABSCESS OF; LUNG AND MEDIASTINUM, TUMOURS OF; TUBERCULOSIS, PULMONARY.*)

THROMBO-ANGIITIS OBLITERANS. (*See also ARTERIES, DISEASE OF.*)
Sir W. I. de C. Wheeler, F.R.C.S.I.

The reviewer¹ drew attention to the fact that this disease is not confined to male adult Jews as previously believed. Most of the original work comes from Leo Buerger, of New York. The disease never occurs in a woman. In a typical case of the lower extremities there is redness or cyanosis of the foot when it rests in the dependent position, pallor of the foot on movement of the ankle-joint, intermittent claudication when the patient walks for a few minutes, and absence of pulsation in the arteries of the foot. Trophic lesions may be the first sign, and there are acute cases in which gangrene very rapidly develops.

The reviewer has seen some very interesting cases in the Mayo Clinic during the present year. The effects of thoracic and lumbar sympathetic ganglionectomy have been carefully explored. **Lumbar Sympathetic Ganglionectomy** has been employed in cases of thrombo-angiitis obliterans. The surface temperature increases after the operation, but not to the same degree as observed in cases of Raynaud's disease. After the operation the relief of pain and the healing of ulcers were frequently spectacular.

Indications for Ligation of the Femoral Vein.—G. W. Van Gorder² recommends high vein ligation in this condition. By merely ligating the femoral vein the venous circulation is obstructed and the arterial blood in the capillaries is permitted to bathe the tissues a longer time than would be the case if the venous circulation was obstructed. In threatened gangrene of the lower limb due to partial occlusion of the arteries vein ligation has a proper field. The reviewer has employed this operation with success, and combined it with femoral artery sympathectomy so as to obtain dilatation of the distal arterioles. In one case (MEDICAL ANNUAL, 1929, p. 524) the operation was performed in a patient of 62 with a blood-pressure of 220, a pulse-rate of 120-140, and a fibrillating heart. In this case a large popliteal aneurysm was leading to obstruction of the circulation below. The foot was cold and gangrene was impending. The patient was cured by ligation of the vein and resection of portion of the femoral artery. He was seen a year later. There was good circulation of the limb and the aneurysm had disappeared. Van Gorder states that recent experimental studies on this question have shown that the procedure of ligating the main vein simultaneously with the main artery of an extremity results in: (1) An increase in the venous pressure; (2) An increase in the volume flow of blood beyond the ligated artery; (3) An increased residual arterial pressure; (4) An increase in the peripheral arterial circulatory bed; and (5) A decreased incidence of gangrene. His conclusions are as follows: (1) High ligation of the vein in the treatment of thrombo-angiitis obliterans is justified, and is to be highly commended; (2) Of 9 cases of this disease treated by this method, pain was controlled, and gangrene arrested or improved, in 8; (3) Ligation of the external iliac vein does not appear to have any marked advantage over ligation of the superficial femoral vein in Scarpa's triangle, so far as could be determined by post-operative clinical observation in this series of cases; (4) Of all the forms of conservative treatment employed in his clinic for thrombo-angiitis obliterans, high ligation of the vein appears to be by far the most promising.

REFERENCES.—¹*Brit. Med. Jour.* 1927, i, 225; ²*Ann. of Surg.* 1929, July, 88.

THROMBOSIS, PULMONARY. (See PRE- AND POST-OPERATIVE TREATMENT.)

THYROID GLAND. (See also GOITRE.)

W. Langdon Brown, M.D., F.R.C.P.

Although many observations have been published on the thyroid gland during the past year, very little has been added to our knowledge. They have chiefly confirmed the experience of recent years.

ANATOMY.—Scott Williamson and Innes Pearse¹ have extended their former studies, and conclude that the thyroid and thymus must be regarded as an apparatus in all considerations of the thyroid function. The thyrothymic lymph system is a closed one, and the lymphogenic secretion of the thyroid, which they regard as responsible for thyrotoxicosis, is normally detoxicated in this lymph system. They accordingly advocate **Thymectomy** in the treatment of thyrotoxicosis, and make deductions as to the spread of the metastases

in thyroid cancer based on this anatomical study. They also suggest that cystic hygromas of the neck originate in developmental abnormalities of this thyrothymic lymph system.

Hyperthyroidism.—

PATHOLOGY.—T. P. Dunhill,² in a valuable résumé of his views based upon personal experience, maintains that there is one disease ranging in a graded series from exophthalmic goitre on the one hand to toxic adenoma on the other. All varieties of transitional forms can be found. He does not approve of the label 'hyperthyroidism' for a disease which he regards throughout its whole range as a toxic state. There are three primary factors: (1) the stimuli, (2) the gland, (3) the cells of the body—especially the heart. The stimuli include iodine, acute infections, the reproductive organs, and psychic states. These will vary in their intensity and in their effect at different epochs of life. As to the state of the gland, the earlier in life that it is affected, the more normal the thyroid epithelium is likely to be at the onset, while later in life it is more likely to have been affected by waves of activity and involution. If the whole gland is normal, it can all respond, and 'primary toxic goitre'—i.e., Graves' disease—results. If the thyroid is already in a state of colloid goitre when first affected by one of the stimuli referred to, its epithelium is already to some extent exhausted or destroyed. It therefore cannot react to the same extent as the normal gland would. If the toxic change comes soon after a colloid goitre, the hyperplasia may be universal in the epithelium lining the vesicles, producing the 'lace-like' appearance, as it has been called. If it comes later, there are more likely to be nodules of hyperplasia which have become localized on account of the inevitable fibrosis that has now had time to occur. By the fourth decade the stimulus is less intense and there is less epithelium capable of responding to the stimulus. Therefore exophthalmos and the symptoms due to the central nervous system tend to be less and often are absent, so much so that the disease at this stage has been described as a different disease—a toxic adenoma. But now the cardiovascular signs and symptoms predominate because of the third factor. Earlier in life the altered thyroid secretion may be of high toxicity, but if the cardiac neuromuscular mechanism is young and unimpaired, tachycardia alone results, and although this may be severe, the rhythm remains regular until at last the reserve is broken. But if the heart muscle is older when the impact comes, a slight degree of thyroid toxicity will break down its reserve, and irregularity of rhythm occurs early. This slighter toxicity accounts for the infrequency of marked eye symptoms at this time of life. The author will not agree that the histopathological appearances should alone be used in the classification of goitres without taking the clinical condition of the patient into account. Such a claim can, indeed, only be put forward by the pure laboratory worker—yet it has been made. The whole of this article is characterized by breadth of view.

E. P. Sloan³ lays emphasis on the infection of the substance of the thyroid gland in the etiology of Graves' disease. While it is true that A. Cantero⁴ isolated a non-hæmolytic streptococcus in 89 cases out of 160 of adenomatous goitre, we cannot agree with Sloan that infection is the sole factor in causation. M. P. Weil and M. Iselin⁵ take the same view as Dunhill in the matter of primary and secondary toxic goitres.

SIGNS AND SYMPTOMS.—The value of the basal metabolic rate is increasingly recognized. G. M. Goodwin,⁶ in distinguishing between the metabolic and nervous symptoms of hyperthyroidism, states that in a nervous adolescent girl with a goitre the diagnosis of hyperthyroidism should be made with great reluctance unless the basal metabolic rate is increased. H. M. Clute and

D. H. Daniels⁷ urge the importance of not mistaking the normal increase in this rate during pregnancy for evidence of hyperthyroidism.

COMPLICATIONS.—C. A. Elliott⁸ points out that although we should not expect the occurrence of asthma in hyperthyroidic states, since the former is vagal and the latter sympathetic in its associations, yet it does occasionally occur. He reports six cases, one of which is specially interesting because infected antra were found. Now, antral sepsis can be a factor in both asthma and hyperthyroidism.

TREATMENT.—

Iodine.—G. S. Fahrni⁹ deprecates prolonged use of iodine before operation, because patients are less willing to have an operation after this initial improvement, and operation is thus delayed and made less favourable. On the other hand, he advocates prolonged administration of iodine after operation. Dunhill puts the position clearly by saying that where operation is obviously indicated it is wise to withhold iodine until twelve or fourteen days before operation; but in milder cases which may never need operation many authorities would not hesitate to try iodine for a much longer period. Moreover, L. Dautrebande,¹⁰ continuing his observations on the value of small and frequently repeated doses of iodine, claims that in bad and resistant cases he has had success by giving from 5 to 20 doses a day, though the total quantity given in the day may be quite small. W. O. Thompson and others¹¹ noted that patients might develop myxœdema after thyroidectomy if they were given iodine in spite of having returned a normal basal metabolic rate. They attributed this to an inhibition of the secretion of normal thyroxin. They suggest that iodine lowers the high metabolic rate of Graves' disease by the same process.

Surgical Treatment.—Many articles have appeared on surgical technique. G. W. Crile¹² describes his method of avoiding risk to the recurrent laryngeal nerves, for, as he says, "unilateral abductor paralysis after thyroidectomy is unfortunate; bilateral abductor paralysis is a tragedy"—and one which may demand tracheotomy. F. H. Lahey¹³ claims that there are essentially no thyrocardiacs who are too decompensated to withstand subtotal thyroidectomy without dire risk. Out of 101 such patients traced on an average three and a half years after operation, 95 had returned to full functional activity. L. M. Zimmermann¹⁴ describes eight cases of a paradoxical development of exophthalmos after operation, although it had been absent or only slight before. In three cases it was unilateral. H. M. Richter had three similar examples. S. Ginsburg¹⁵ speaks highly of **Radium** in the treatment of toxic adenoma and Graves' disease in preference to operation, but Dunhill² has seen some quite bad results. Dunhill further suggests that X-ray treatment may damage the parathyroids, for of the three cases of post-operative tetany he has had, two had received much X-ray treatment. S. F. Haines and W. M. Boothby¹⁶ report good results after thyroidectomy from the employment of the **Oxygen Chamber** for pulmonary œdema, bronchopneumonia, or obstruction to the upper respiratory tract.

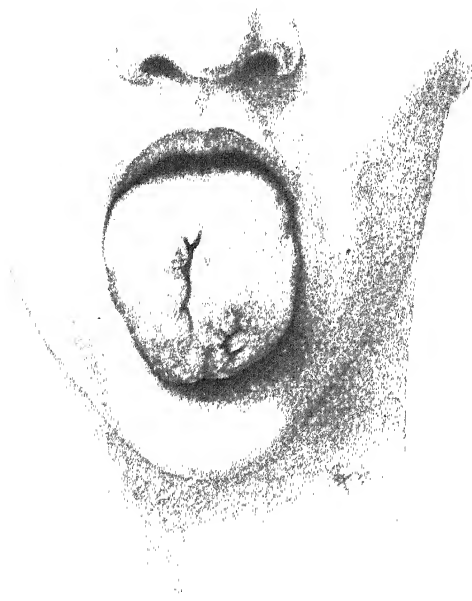
Hypothyroidism.—W. O. Thompson and others¹⁷ have found that the concentration of protein in the cerebrospinal fluid is high in myxœdema and usually drops after administration of desiccated thyroid while the rate of flow increases. W. M. Kraus, S. Brock, and P. Sloane¹⁸ class together a number of neurological conditions occurring in cretins as 'thyronal dystrophy'. It is a familial and probably congenital disorder of neuromuscular control of central origin, consisting of any or all of the following: chorea, athetosis, static fits, rigidity, ataxia, abnormal reflex changes, postural defects, and signs referable to disturbed function of the vegetative nervous system associated with a variable degree of mental and thyroid defect. The condition may be so severe



PLATE LX

TUBERCULOUS ULCER OF TONGUE

(H. CHITTY)



as to imitate precisely advanced cases of cerebral diplegia. It is well known that a normal thyroid gland is necessary for the development of a normal central nervous system; hence early administration of **Thyroid** is essential in these cases.

A. A. Thommen¹⁹ calls attention, as Hertoghe originally did, to the extraordinary variety of symptoms which may be due to minor degrees of hypothyroidism and which can be relieved by **Thyroid Medication**.

Malignant Disease.—W. O. Johnson²⁰ describes two cases of adenomata of the thyroid lasting for over sixteen years which ultimately became fibrosarcomata. This he regards as an additional reason for the routine removal of such adenomata. S. O. Portugaloff²¹ describes a successful transplantation of thyroid tissue in a case of complete thyroidectomy for cancer.

Pharmacology and Therapeutics.—C. C. Lund and E. B. Benedict²² urge the importance of further study of the influence of the endocrine secretions on the action of drugs, and vice versa. They found that in rabbits a large dose of morphia lowers the basal metabolic rate by 10 per cent in the normal animal, and by 20 per cent in the hypothyroidic animal, while having no effect on the rate in the hyperthyroidic animal. N. C. Stevens²³ warmly advocates thyroid extract for menopausal headache, especially if the metabolic rate is definitely subnormal. W. A. Jackman²⁴ recommends thyroid extract in the treatment of parenchymatous goitre when there is evidence that the enlargement is compensatory, but hardly appears to stress sufficiently the importance of making a diagnosis of hypothyroidism first. Thyroid extract is warmly recommended by several observers for nephrosis.

REFERENCES.—¹*Brit. Jour. Surg.* 1930, Jan., 529; ²*Ibid.* 24; ³*Amer. Jour. Surg.* 1929, Aug., 194; ⁴*Canad. Med. Assoc. Jour.* 1930, March, 343; ⁵*Presse méd.* 1930, Feb. 5, 173; ⁶*Amer. Jour. Med. Sci.* 1929, July, 83; ⁷*Ibid.* 1930, April, 477; ⁸*Amer. Jour. Surg.* 1929, Sept., 333; ⁹*Canad. Med. Assoc. Jour.* 1929, Nov., 511; ¹⁰*Presse méd.* 1929, July 24, 957; ¹¹*Amer. Jour. Med. Sci.* 1930, June, 733; ¹²*Surg. Gynecol. and Obst.* 1929, Oct., 358; ¹³*Ann. of Surg.* 1929, Oct., 750; ¹⁴*Amer. Jour. Med. Sci.* 1929, July, 92; ¹⁵*Arch. of Internal Med.* 1929, July, 73; ¹⁶*Amer. Jour. Surg.* 1929, Jan., 1; ¹⁷*Arch. of Internal Med.* 1929, Sept., 368; ¹⁸*Amer. Jour. Med. Sci.* 1929, Oct., 548; ¹⁹*Med. Jour. and Record*, 1930, June 18, 603; ²⁰*Ann. of Surg.* 1929, July, 29; ²¹*Ibid.* 37; ²²*New Eng. Jour. Med.* 1929, Aug. 22, 345; ²³*Ibid.* July 25, 168; ²⁴*Bristol Med.-Chir. Jour.* 1929, 277.

TIC DOULOUREUX. (See NASOPHARYNX, ENDOTHELIOMA OF; NEURALGIA, TRIGEMINAL.)

TONGUE, TUBERCULOUS ULCERS OF.

A. Rendle Short, M.D., F.R.C.S.

This condition is rare, and may take one of two forms. The commoner is a soft, shallow, yellowish ulcer, circular in shape, and very painful, often with satellite tubercles around it. The patient generally has phthisis. The other form is shown in *Plate LX*. The tongue exhibits one or more fissures, very like those of tertiary syphilis, but usually smaller and more localized. It is not particularly painful, and as a rule there is no evidence of phthisis. Excision cures the fissure variety of tuberculous tongue, but is generally useless for the circular ulcer.

The following note is kindly supplied by Mr. H. Chitty, with reference to the case illustrated:—

B. S., female, age 41.

HISTORY.—Ulcers present about eight to ten months.

ON EXAMINATION.—Tongue very painful and patient only able to take soft foods. No clinical or skiagraphic evidence of tuberculosis in chest. Wassermann reaction negative. Ulcer of tip of tongue and fissure down mid-line present; both shallow, and free from any induration.

PATHOLOGICAL REPORT OF SNIP FROM ULCER.—"Destruction of surface epithelium. Deep infiltration of submucous tissues by chronic inflammatory cells. A typical single giant-cell seen, and although no typical follicular arrangement present, lesion almost certainly tuberculous."

TREATMENT.—Destruction of ulcers by diathermy.

Dec. 3.—Tongue quite healed, with little scarring. Chest still shows no evidence of any tuberculous infection. Health fairly good.

TONSILS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

The question as to the definite relationship between the clinical and bacteriological findings in tonsillar tissue is still uncertain. E. Wirth¹ has attempted to throw light on this subject by a bacteriological examination of a series of tonsils which had been removed, together with virulent tests on mice. The most important findings seem to be that, while 6 apparently normal tonsils in healthy individuals were sterile, 7 from the subjects of general diseases, such as rheumatism, nephritis, etc., gave pathogenic bacteria in 6. The percentage of pathogenic organisms was greater in cases in which there was some enlargement of the glands in the neck. The author concludes that the bacteriological examination of apparently normal tonsils in patients with general diseases such as rheumatism will throw some light on the possibility of their being the septic focus responsible for the general disease. The presence of pathogenic organisms, particularly mouse-virulent hæmolytic streptococci, is evidence that the tonsils are unhealthy and indicates their removal if no other obvious focus exists.

Tonsillomycosis.—The subject of affections of the tonsils due to fungi is dealt with by Sir A. Castellani.² From a pathological point of view, fungi pathogenic to man may be divided into two groups: yeast-like organisms and filamentous fungi. Clinically, such cases may be separated into acute and chronic types.

ACUTE TONSILLOMYCOSIS.—This is met with in two varieties: follicular, and membranous or diphtheria-like.

Follicular Tonsillomycosis.—This is usually due to a yeast fungus and is characterized by whitish spots on the tonsils corresponding to the openings of the follicles (*Plate LXI, A*). There is some soreness of the throat, but constitutional disturbance is slight and spontaneous recovery usually occurs in two or three weeks. Diagnosis is based on the microscopical and cultural examinations of the patches, which show an abundant growth of yeast cells, with few, if any, other organisms. The local application of **Glycerin and Borax** or diluted **Tincture of Iodine** is indicated. In resistant cases **Potassium Iodide** should be given internally.

Membranous Type.—This also is usually caused by a yeast-like organism. The onset is sudden, with severe sore throat and constitutional disturbance, and fever up to 102°. The cervical glands are swollen and tender. Cream-white patches are present on the tonsils (*Plate LXI, B*), uvula, and soft palate, and, on removal of these, a very slightly ulcerated surface is left. The prognosis is usually favourable, although in Ceylon cases have occurred in which the infection has spread to the lungs with a fatal termination. The condition is differentiated from diphtheria by means of the bacteriological examination, as it is also from Vincent's angina. In addition, in the latter disease the ulceration is frequently rather deep. Treatment consists in applying diluted tincture of **Iodine** with **Chlorine** gargles and **Potassium Iodide** internally.

CHRONIC TONSILLOMYCOSIS.—The principal types are: (1) Tonsillo-actinomycosis; (2) Tonsillo-pseudo-actinomycosis; (3) Tonsillomycosis fusca; (4) Tonsillomycosis spiculata.

PLATE LXI

TONSILLOMYCOSIS

(SIR A. CASPSELL)

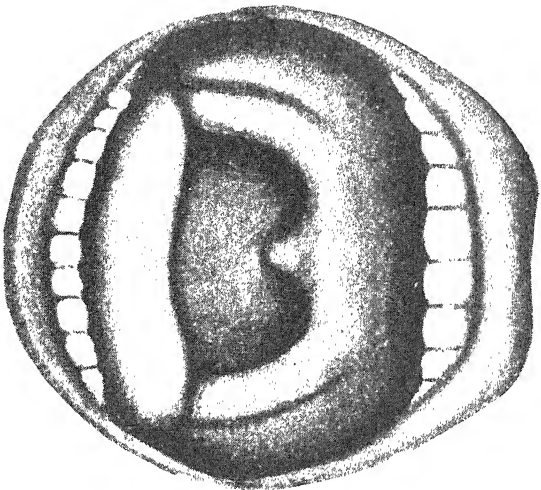


Fig. A.—Tonsillomycosis follicularis.

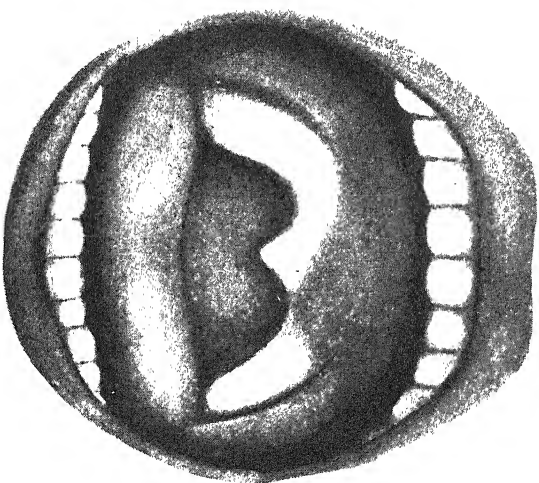


Fig. B.—Tonsillomycosis membranacea (T. albidofusca).

By kind permission of the 'Pictorial'

1. Tonsillo-actino-mycosis is rare, and is characterized by a slowly forming abscess in the peritonsillar tissues on one side, with some enlargement of the glands in the neck and difficulty and pain in swallowing. The abscess eventually ruptures through several openings, discharging pus containing the typical yellow granules. The discharge continues indefinitely and the infection may spread to other parts. The diagnosis is made on these characteristics together with microscopical examination. Large doses of **Potassium Iodide**, from $\frac{1}{2}$ to 1 drachm thrice daily, will usually produce resolution.

2. These cases differ from the former in that they are due to a different type of fungus, typical yellow granules not being present, and iodides being much less efficacious in treatment.

3. This variety is due to a filamentous fungus, and as a rule the condition is not serious. It is characterized by brownish-yellow spots at the mouths of the follicles which may coalesce, and some degree of constitutional disturbance may be present. The condition usually clears up spontaneously, although it may last for a long time, and is probably confined to southern Europe, India, and South Africa. Treatment consists in the local application of **Iodine** with **Iodides** internally.

4. This condition is characterized by the presence of grey spicules several millimetres in length, usually originating from the crypts of the tonsils. It runs a chronic course, with slight discomfort in the throat. The treatment consists in local application of diluted tincture of **Iodine** with **Iodides** internally. [This condition would seem closely to resemble keratosis tonsillaris.—A. J. M. W.]

Tonsillar Fætor.—Fætor associated with chronic tonsillar infections is not uncommon. It may occur in tonsils which are enlarged but apparently otherwise healthy, or in the presence of an obvious tonsillitis. Sir A. Castellani³ has investigated the bacteriology of such cases and has isolated two bacilli belonging to the genera *Escherichia* and *Alkaligenes* respectively.

Tonsils and Scarlatinal Infection.—Scarlet fever may be regarded as a disease in which the primary lesion is streptococcal and in the tonsils, but is associated with a systemic infection. K. Jordanoff⁴ has investigated the effect of the presence or absence of tonsils on the incidence of scarlet fever. He found that, of 110 cases of scarlet fever, only 2 had had the tonsils removed, and in these the removal had been carried out a few days previously and the illness was apparently a wound infection. In addition, of 362 cases of children from whom the tonsils had been removed, only 12 subsequently contracted scarlet fever. Of these 12, in 3 the condition followed the operation and was a wound infection. Of the remaining 9, on examination it was found that in all the operation had been incomplete. In addition, in 6 families in which scarlatinal infection took place, the child whose tonsils had been removed alone escaped the infection.

Tonsil Operations : Complications.—The occasional occurrence of an abscess of the lung after operation on the tonsils has received considerable attention. It is undecided whether the infection reaches the lung via the blood-stream or by aspiration at the time of operation. An ingenious method has been employed by R. V. May, T. W. Thoburn, and H. C. Rosenberger⁵ to ascertain to what extent aspiration of blood and secretions normally took place during the performance of tonsillectomy under a general anæsthetic. The method consisted in the injection of iodized oil into the pharynx during the operation, together with a subsequent X-ray examination of the chest. They found that some aspiration could be demonstrated in about half the cases, but the aspirated material was usually rapidly expelled. They found that the amount of aspiration could be to some extent controlled by technique,

factors minimizing it being the adoption of the Trendelenburg position, the constant removal of secretions by mopping or suction, the diminution of secretion by the use of atropine, and the use of light anaesthesia to preserve the cough reflex. They conclude that some aspiration is unavoidable in all operations requiring an inhalation anaesthetic, but that its degree was considerable under control.

REFERENCES.—¹*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* 1929, Sept. 10, 379; ²*Practitioner*, 1930, Jan., 67; ³*Lancet*, 1930, i, 623; ⁴*Munch. med. Woch.* 1928, Dec. 21, 2172; ⁵*Jour. Amer. Med. Assoc.* 1929, Aug. 24, 589.

TORTICOLLIS, SPASMODIC.

Geoffrey Jefferson, M.S., F.R.C.S.

Spasmodic torticollis is an uncommon but disabling malady. The clinician will be wise if he regards all cases in the first instance as being of reflex or mental origin, and it is a fact that in most instances some kind of emotional disturbance will be discoverable. In the lesser cases the appropriate treatment will lead to the cessation of the spasms, the best results being obtained by **Hurst's Method** of a single session prolonged until the contractions cease. It must be admitted that a number of cases of spasmodic torticollis are resistant to all forms of psychotherapy, and that in spite of all that is done the condition drags on, weeks lengthening out into months, and months into years. In such persons the inference is irresistible that a definite organic basis is present. Clonic muscular contraction, especially of the severe kind which is seen in really bad cases, is not the sort of reaction which one would expect a hysterical person to think of for himself. It has, it is true, a great spectacular value, but it requires a higher inventiveness to create it than does a plain psychotic paralysis, for example. Foerster, of Breslau, in 1918 declared that the majority of cases were due to a lesion of the corpus striatum, presumably of an encephalitic toxic order, and that view has steadily gained ground, although there is no direct evidence of its truth. The belief has been arrived at chiefly by a process of exclusion and inductive reasoning. The point is of very considerable importance, because if it is true that there is an organic cause for the state of spasmodic torticollis, and if that cause is in such a place and of such a kind that its treatment is impossible, then we must seek what we can do by peripheral surgery to cure, or at least relieve, the spasm. We will suppose that all attempts to cure the condition by suggestion and the like have failed, and that the contractions are sufficiently disabling to make intervention desirable, or even imperative. The classical operation is that of division of the spinal accessory nerve, which throws out of action the sternomastoid and part of the trapezius muscles. This simple operation will relieve most of the cases; and some may be cured, but by no means all, for even the most casual examination will show that the deep muscles of the neck are equally involved.

Spasmodic torticollis is not, in other words, a state of one particular muscle or even two, but affects all the muscles concerned in head-rotation. Thus, the deep and the superficial muscles of one side may be affected, or the deep of one side and the superficial of the other. In order to denervate the deep muscles Keen many years ago (1891) advised section of the upper three cervical nerves at their exit from the vertebral canal—an exceedingly difficult and arduous operation. More recently K. G. McKenzie,¹ of Toronto, reported a case from Cushing's clinic in which the cleaner and easier operation of intradural division of these nerves was carried out by **Laminectomy**. In this case, a female of 51 with a five-year history of torticollis, the spinal accessory and the first, second, and third cervical nerves were gently hooked up and divided. The severe spasms entirely disappeared and the patient was able to perform her household duties, though slight tremor persisted. In this case both anterior

and posterior cervical roots were cut. McKenzie suggested that it might be sufficient to divide the posterior roots alone, on the ground that breaking of the reflex arc should abolish the tone in the muscles. C. H. Frazier,² of Philadelphia, records the results of this treatment in four cases, all of them favourable. In the one case, which he describes in detail, the right sternomastoid and the left posterior muscle mass were in contraction. He crushed and ligatured (Frazier's alternative to section of the roots, as it avoids hæmorrhage) the upper three posterior cervical roots on the right side and two on the left. He believes that the spinal accessory should be divided also, either at the same intradural operation or by a separate incision in the neck. He declares himself as well satisfied with the results obtained, all four patients having made good recoveries. It is necessary to remove the posterior margin of the foramen magnum in order to get good access, but this is a simple procedure and in no way adds to the risks of the operation. It seems that this method of 'de-afferenting' the affected muscles, together with division of the spinal accessory on one side, holds out greater hopes of a real cure than the more limited operations that have been in vogue. Whilst the relative severity of the operation should have the good effect of ensuring a wise selection of cases, it must not be thought that it is particularly dangerous in good hands.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1924, July, 5; ²*Ann. of Surg.* 1930, June, 848.

TRACHEA, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Foreign Body.—In addition to the symptoms produced by a loose foreign body in the trachea due to its movement, A. Alcaino¹ points out that a syndrome of signs and symptoms occurs as a result of the efforts of the patient to prevent movement of the foreign body, with resultant attacks of laryngeal spasm. This syndrome consists of: diminution of the voluntary respiratory reflexes, coughing, laughing, or deep breathing being as far as possible avoided. So shallow is the breathing that costal respiration is scarcely perceptible, and rigidity of the respiratory muscles restricting movement can be felt. The patient adopts a particular position, being bent forwards and sideways with legs drawn up, and resists any alteration from this position.

Retained Tracheotomy Tube.—Cases in which it is found impossible to leave out the tracheotomy tube after the performance of an emergency tracheotomy are not uncommon. In the very great majority of cases, if not in all, this is due to the tracheotomy having been performed too high up, with resulting subglottic swelling and stenosis. In cases in which the tube has not been retained for a very long period, the performance of a low tracheotomy will usually allow the swelling to subside, and is all that is required. In old-standing cases, however, cicatricial stenosis may necessitate instrumental dilatation. If such is necessary, the alternatives are intermittent or continuous dilatation. W. T. Gardiner² showed four cases in which continuous dilatation had been or was being employed with satisfactory results. The dilatation was carried out by an upstem attached to the tracheotomy tube, and this would seem to be more rational than the employment of an intubation tube inserted from above.

REFERENCES.—¹*Rev. Espan. y Amer. de Laringol.* 1929, Nov., 451; ²*Jour. Laryngol. and Otol.* 1929, Nov., 772.

TRACHOMA. (See CONJUNCTIVA, DISEASES OF.)

TRAUMATIC NEUROSES. (See MENTAL AND NERVOUS SEQUELÆ OF TRAUMA.)

TRICHINOSIS.*J. D. Rolleston, M.D.*

SYMPTOMS AND COMPLICATIONS.—J. C. Willett and C. L. Pfau¹ report an outbreak of 21 cases with one death, 13 of which resulted from eating improperly cured summer sausage, and 8, including the fatal case, from eating raw pork sausage. Most of the cases showed a marked eosinophilia, but one patient who died on the sixteenth day, in whom generalized peritonitis was found post mortem, had no eosinophilia. In all the patients pronounced symptoms of trichinosis were present before the first case was diagnosed twenty days after the onset. In most cases a provisional diagnosis of typhoid or malaria had been made.

According to S. S. Horlick and R. E. Bicknell,² since trichinae were discovered in the central nervous system by Lintz and van Colt in 1913 several clinicians have reported cases of trichinosis with symptoms referable to the central nervous system. Horlick and Bicknell, however, have been unable to find any case report in which so many organs and tissues were infested as in the following case. The patient was a woman, age 52, in whom the diagnosis of trichinosis was established by the characteristic clinical symptoms and eosinophilia, as well as by finding the larval form of *Trichina spiralis* in the blood and sections of muscle during life. A fortnight before death she developed symptoms of toxic psychosis and encephalitis. Post mortem trichinae were found in the myocardium, pancreas, kidney, intestinal mucosa, and straw-coloured fluid from the distended gall-bladder. Permission to examine the brain and spinal cord could not be obtained.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, xciv, 1060; ²*New Eng. Jour. Med.* 1929, cci, 816.

TRICHOPHYTIDES. (*See SKIN, FUNGUS INFECTIONS OF.*)**TRIGEMINAL NEURALGIA.** (*See NASOPHARYNX, ENDOTHELIOMA OF; NEURALGIA, TRIGEMINAL.*)**TRYPANOSOMIASIS.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

TREATMENT.—G. Maclean¹ reports 52 cases of rhodesiense sleeping sickness treated with **Bayer 205** and **Tryparsamide** up to the end of 1925, and nearly all the survivors were followed up to 1928. In 25 of them two injections of 1-grm. doses of Bayer 205 were followed after one or two months' interval by twelve weekly injections of tryparsamide, beginning with 2 grm. and working up gradually to 4 grm., with an interval of a month after each series of four doses. The majority of early cases recovered on Bayer 205 alone, but more advanced ones only if tryparsamide was also given. The only toxic effect of tryparsamide was optic neuritis, which was usually complete and permanent. If albuminuria follows Bayer 205, the injections should be stopped until it has cleared up. Cases which remain well for two and a half years rarely relapse, and the combined drugs act best. The same worker² reports a trial of **Präp. 3510**, a German arsenical preparation of undisclosed formula, but in moderate doses it proved much less efficacious than Bayer 205 and tryparsamide, and in larger doses the margin of safety is too narrow to make it of practical value when administered alone.

W. Yorke, A. R. D. Adams, and F. Murgatroyd,³ as a preliminary to an investigation of the action of arsenical preparations in experimental trypanosomiasis, have re-investigated the duration of life of the parasites *in vitro* in blood serum, and have found that it is possible to maintain a trypanosome suspension not exceeding about 1000 per c.mm. alive *in vitro* at 37° C., without material loss of numbers, for twenty-four hours in serum to which glucose has

been added. With the aid of this method⁴ they have carried out an elaborate re-investigation of the action *in vitro* of human serum on pathogenic trypanosomes, and they report that normal serum or plasma *in vitro* at 37° C. rapidly destroys *T. rhodesiense*, *T. equiperdum*, and *T. congolense*, but that *T. gambiense* is apparently unharmed by either, and they suggest that this is the explanation of man's comparative susceptibility to *T. gambiense* infections. They also bring forward the hypothesis that both the human forms of trypanosome infections are derived from *T. brucei*, but that the greater frequency of infection of man by *T. gambiense* is due to its having acquired resistance to human serum as the result of man-glossina-man passages. The much greater resistance of rhodesiense infections to treatment is well known, and J. F. Corson⁵ has recorded a relapsing case from which he was able to infect rats while the patient was under treatment with tryparsamide. D. E. Wilson⁶ has tried three samples of British-prepared **Fourneau 309**, but only one proved to be efficacious.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1929, Nov., 337; ²*Ibid.* 345; ³*Ibid.* Dec., 95; ⁴*Ibid.* April, 115; ⁵*Jour. Trop. Med. and Hygiene*, 1930, July 1, 187; ⁶*Ibid.* 1929, Nov. 1, 305.

TUBERCULOSIS. (See also JUVENILE INFECTIONS, DIATHESIS IN; PHOTOTHERAPY.)

TUBERCULOSIS OF THE CENTRAL NERVOUS SYSTEM.

Geoffrey Jefferson, M.S., F.R.C.S.

In previous issues of the MEDICAL ANNUAL (1928, p. 66; 1930, p. 298) reference has been made to the comparative rarity with which tuberculosis occurs in the brain in the form of a definite tumour mass. It is important that this infrequency should be recognized, because the old tradition is a long time in dying. We must give full recognition to the truth, which is that, given a patient with an intracranial tumour, it is unlikely that the tumour is tuberculous unless very definite signs of tuberculosis are present in the lungs. That tumour, or infection of the lung, is a likely source of cerebral embolic deposit is well recognized, and tuberculosis no less than carcinoma may become lodged in the brain and give rise to symptoms there, whilst the primary source may have escaped recognition. Such cases will always be fertile causes of error. In contradistinction to the true tuberculoma, tuberculous infection of the meninges is very common, and most hospital records, particularly those of children's hospitals, show a large number of these cases annually. It is the single mass of tubercle forming a tumour, giving rise to increased intracranial tension and perhaps localizing signs, which is the relative rarity.

F. H. Leavitt¹ in a recent study found that of 350 verified brain tumours in the Philadelphia hospitals 23 occurred in children, and of these only 2 were tuberculomata, whilst apparently none of the adult tumours were of this kind. The majority of the childhood cases were cerebellar gliomata arising in the mid-line, in the roof of the fourth ventricle. P. Schidlowsky² in an important paper records figures from Russian hospitals which show a higher incidence—1 tuberculoma to every 30 brain tumours in Kiev, but 8 tuberculomata in 47 tumours at Leningrad. Leavitt's figures probably give an underestimation of tuberculomata in a general town-dwelling population; Schidlowsky's 3 per cent is nearer the mark in his Kiev series, but the Leningrad figures are very high and must have some local explanation. It seems likely that no definite percentage of incidence can be laid down as a universal rule, but in countries where the national hygiene is reasonably good, a figure in the neighbourhood of 2 per cent is likely to be correct.

PROGNOSIS.—The prognosis in brain tuberculoma is bad, worse than in the gliomata, and this for two reasons: first, tuberculosis may be active elsewhere, and, secondly, operative intervention is very apt to cause a dissemination of the disease, with fatal meningitis. The alternative—to do nothing—is often not feasible because it may be impossible to tell beforehand that the cause of the patient's symptoms is a tuberculoma and not a glioma or other type of tumour, and the medical adviser cannot well allow a patient to become blind and to suffer agonies in the hope that the lesion is tuberculosis and may eventually heal spontaneously. Altogether, the tuberculomata form a very difficult and deadly group.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1929, Aug., 229; ²*Arch. f. klin. Chir.* 1929, Aug., 703.

TUBERCULOSIS, PULMONARY.

W. H. Wynn, M.D., F.R.C.P.

BACTERIOLOGY.—Hitherto the occurrence of bovine tubercle bacilli in human pulmonary tuberculosis has been regarded as rare and of little practical importance. Park and Krumweide found only 2 examples in 680 cases, and Stanley Griffith 3 in 212 cases. W. T. Munro,¹ by systematic sputum examinations in sanatorium patients since 1921, has found 10 patients out of 250 who coughed up bovine type bacilli: 5 of the cases showed the distribution common in the ordinary human type of infection, 4 showed a spread from the roots, and 1 only showed abscess formation. The most notable features were the amount of fibrotic change, the lack of evidence of much breaking-down of lung tissue, and no hæmoptyses. He considered that there was more chance of these patients' overcoming their infection than is the case with human-type infections. The route of infection appeared to be through the tonsils and cervical glands.

PROPHYLACTIC VACCINATION.—**B.C.G. Vaccine** continues to attract much interest, and Calmette's claims are subjected to much criticism. His contention that the virulence of B.C.G. is fixedly and permanently attenuated cannot be accepted in view of recent experiments. S. A. Petroff² has demonstrated in the B.C.G. strain two types of colonies: one, the R type, was avirulent to guinea-pigs, and the other, S type, was capable of giving rise to generalized tuberculosis. E. A. Watson and others have shown that virulence can be restored by animal passage and by certain *in vitro* procedures. These results are in agreement with observations on other micro-organisms which have shown that when a strain loses virulence after repeated subculture the initial virulent smooth bacteria have been replaced by avirulent rough bacteria. So long as a certain proportion of the smooth type remains, the whole culture shows some virulence, but when the proportion has dropped below a certain level its virulence falls. If the replacement has not gone too far, it may be possible to restore the full virulence by, for instance, animal passage. This depends upon an increase in the proportion of smooth to rough organisms in the culture. The possibility of this occurring after administration of B.C.G. to human beings is therefore not entirely devoid of risk. However, about 400,000 infants have been vaccinated without apparent ill result.

W. H. Park,³ of the New York Health Department, has given B.C.G. to 167 infants in tuberculous families, and observed 280 infants born in tuberculous families as controls. In the latter the death-rate from tuberculosis was 8.6 per cent, and in the former 1.2 per cent. These figures, although small, serve to confirm the reports from France. The question becomes one of expediency. Although most authorities would hesitate to apply the method to all infants, there are many who would administer B.C.G. to infants born in tuberculous families, considering that the risk, if any, would be much less

than that of active tuberculosis. This is the position taken up by G. B. Webb,⁴ who in 1909 inoculated five children with a human tubercle culture of attenuated virulence, of which 120 bacilli were necessary to infect a guinea-pig. Twenty years after, these children are grown men and women without a trace of tuberculosis. The method is also applicable to adults with negative von Pirquet reactions who from the nature of their work are especially exposed to infection. J. Heimbeck⁵ with others found that 56 per cent of medical students before beginning hospital work and coming into contact with tuberculous patients were Pirquet-positive, but during the following two or three years of hospital service 98 per cent were or became Pirquet-positive. As many as 19 out of a group of 339 students developed tuberculosis during this period. Investigations between December, 1929, and May, 1930, have thrown new light on the fate of Pirquet-tested students, some of whom were vaccinated with B.C.G. between 1927 and 1929. Of 183 students, 88 were Pirquet-positive at the outset, and only one developed clinical tuberculosis during his hospital service. Among 51 with a negative reaction and not vaccinated with B.C.G. there were as many as 6 who developed tuberculosis. Among the 44 with a negative Pirquet reaction at the outset and who were vaccinated with B.C.G., not one developed tuberculosis. These figures support Heimbeck's earlier work on hospital nurses reported in the *MEDICAL ANNUAL* in 1929 (p. 490). The younger school led by Heimbeck in Oslo are sceptical of the value of sanatorium and orthodox anti-tuberculosis work, and would base such work on Pirquet tests followed by B.C.G. vaccination of all Pirquet-negatives irrespective of age.

Apical and Subapical Tuberculosis.—It was well recognized by the older British clinicians and pathologists such as W. Ewart and Kingston Fowler, and subsequently by Birch-Hirschfeld, Aschoff, and others abroad, that the initial lesion of pulmonary tuberculosis was not usually found at the apex, but lower down in the subapical region. In spite of this, it has been held that when there have been alterations of resonance and breath-sounds, and especially localized râles at the apices, the patient is tuberculous. On the other hand, physical signs denoting a lesion below the apex have been held to indicate a process of non-tuberculous origin unless prolonged observation and bacteriological examinations prove the contrary. The apical origin of tuberculosis received support from post-mortem examinations on persons who had died from causes other than tuberculosis. In many apical tuberculosis, active, quiescent, or cicatrized, was found, although few if any symptoms of lung trouble had shown themselves during life. It was further held that the onset of pulmonary tuberculosis is usually slow and insidious, and much skill was directed towards the detection of the earliest possible signs of minute apical lesions.

During the last five years, principally as the result of more thorough examination with X rays, a radical change has taken place in our views of the early localization and evolution of tuberculous lesions in the lungs. It has been observed that in a large proportion of active and progressive cases the first lesions are located below the clavicle, while the apices remain free for some time. M. Fishberg⁶ gives a good account of this 'new doctrine'. The first to describe the subclavicular lesions as seen in the radiogram was H. Wessler in 1923, but their significance was first generally realized as a result of the extensive investigations of Assmann⁷ also in 1923. Since Assmann's paper many others have appeared confirming his views. We must now recognize two types of pulmonary tuberculosis in the adult, differing in the site of origin, and in their evolution, and apical and subapical lesions. The majority of tuberculous lesions are found in the apex, and they remain circumscribed to that

region. Nearly all the lesions found at post-mortem which had cicatrized, remained inactive, and gave no trouble during life were in the apices. These lesions may be discovered during life by clinical examination and with the aid of X rays in the course of routine examinations of the healthy, of contacts, and of patients with extrathoracic tuberculosis. But it is noteworthy that patients with these lesions hardly ever suffer from significant symptoms. They may suffer from frequent 'colds', or at times have slight febrile reactions. They may spit blood, and at times tubercle bacilli may be found in the sputum. Apical retraction is seen on inspection, and the changes found on percussion and auscultation are those described as typical of early tuberculosis. But with or without treatment they usually do well and live indefinitely unless carried off by some intercurrent disease. According to Fishberg they supply the clinical material for 'cures' and the early and curable cases considered ideally suitable for sanatorium treatment. Only exceptionally do they develop into active and progressive tuberculosis. As a rule they do not require prolonged and costly treatment. Real exacerbations occur from time to time, during which medical advice is sought, but they soon subside, recovery is rapid, and a change of environment for a few weeks works wonders.

Pulmonary tuberculosis of more serious prognosis generally begins differently, has a relatively abrupt onset, and the lesion in the vast majority is below the clavicle. A patient who has no history of previous pulmonary trouble begins to feel tired, coughs, has night sweats, and may expectorate blood. Physical examination does not give definite signs sufficient to make a positive diagnosis, and valuable time may be lost unless tubercle bacilli are found in the sputum or X-ray examination shows a soft cloudy patch just below the clavicle and often towards the axillary portion of the lung. The nature of the patch is bronchopneumonic. In most cases it is on a level with the second or third interspace, but may be lower, even in the lower lobe. It may be small, the size of a cherry, or involve the greater part of the upper lobe. The apical region appears free from pathological change. The shadow may be clear-cut, but is generally irregular. As softening rapidly takes place at the first X-ray examination there may be signs of a cavity. These early lesions occur mainly in young persons and adolescents. In 167 cases in which the site of the first lesion could be ascertained, 60 per cent of subapical lesions were in persons under 25, as against 36 per cent of apical lesions. These subapical lesions occurring in young persons who feel out of sorts, but in whom no definite physical signs can be found, are apt to be missed and the patients treated for gastritis, neurasthenia, bronchitis, and so on unless a good radiogram is taken. It is only after the lesion has spread to the summit of the lungs and physical signs are easily found that the diagnosis of tuberculosis is usually made. The progress of the lesion can only be followed with the aid of serial radiograms. It may be unaltered for weeks and months. With improvement in the general condition involution may take place and the infiltration be absorbed, leaving merely linear markings or thickened interlobar pleura, and the patient may remain well indefinitely. In active and progressive cases the lesion usually extends upwards, involving the apex, and there results the common variety of chronic phthisis. In a large proportion the lesion caseates, softens, and leaves a cavity. These early cavities may form quickly, within a few weeks, and even before there is any suspicion of tuberculosis. These cavities appear on the radiogram as spherical or oval in shape, isolated in the midst of healthy lung surrounded by a sharply demarcated border consisting of a thin wall. In exceptional instances these early cavities may heal. The differentiation of apical from subapical lesions is of great therapeutic importance. Prophylaxis mainly concerns the latter. Open

tuberculosis is uncommon with apical lesions. Tubercle bacilli were found in the sputum of 66.4 per cent with subapical lesions as compared with 15 per cent with apical. Strict isolation is therefore not indicated in some 85 per cent of apical cases. Prolonged and costly treatment is not required in the majority of those with apical lesions; but those with subclavicular lesions are in need of careful attention. Many require artificial pneumothorax, which should be induced early before the formation of pleural adhesions.

E. Rist⁸ emphasizes the sudden onset of tuberculosis of the lung in adults and its lobar localization. His views are summed up: "The first stage of pulmonary tuberculosis in the adult is always made up of a pneumonic attack, the lesion being generally rather extended from the beginning and showing an early tendency to ulceration. It may occupy the whole of a lung lobe a few days, even a few hours, after the onset. The initial pneumonic lesion may eventually be totally absorbed in exceptional instances. Generally it is only partly absorbed, leaving behind it lesions which undergo the ordinary evolution of tuberculosis. The initial lesion may become entirely caseous, but it is seldom that this stage is seen in post-mortem examinations, as it seems to be short-lived. X rays show how rapidly the tuberculous lesions are excavated; it takes a few days, even a few hours, so that there is hardly space left for an intermediate stage of caseation. Generally a limited area of the pneumonic patch becomes excavated, but it may happen that the whole of it is converted into a cavity."

H. V. Morlock⁹ reports a series of cases to illustrate the early subclavicular infiltration. He points out that in these cases the onset is definite, often with an acute febrile illness which may be diagnosed as influenza, that the physical signs are below the clavicle, usually in the second or third space or in the upper part of the axilla, the only constant physical sign being crepitations. The definite radiological appearance is of an area of infiltration from 2 to 10 cm. in diameter in the infraclavicular or axillary region. The general condition of the patient is extremely good. He makes the point that the lesion is not the acute bronchopneumonic phthisis long known as a clinical picture, as with such a lesion the patient is extremely ill and the radiogram is very different; also bronchopneumonic phthisis is usually fatal, whilst patients with early infiltration may do very well.

THERAPEUTICS. (See also PHOTOTHERAPY.)

Sanocrysin.—J. Gravesen¹⁰ gives the following as his principles of treatment with sanocrysin. Sanocrysin is used primarily when the fresh-spreading disease predominates. If there are further changes in the form of cavities, **Collapse Treatment** is indicated secondarily. Collapse treatment is used primarily when the later changes predominate. Sanocrysin is used as a backing-up for the arrest of the fresh-spreading disease in the collapsed lung and for a fresh extension in the other lung. Sanocrysin and collapse treatment are used synchronously when it is evident that sanocrysin at its best will lead to a process of breaking-down, or where the phase of the disease indicates one kind of treatment for the one lung and different treatment for the other. The author's present system of dosage is as follows. Two courses of treatment are usually given—the first course begins with a dose of 0.1, 0.25, or 0.35 grm. according to the general condition, weight, and extent of disease. The doses are gradually increased, viz., 0.5, 0.6, 0.75, 0.85 grm., and in well-nourished patients with good tolerance to 1 grm. The number of days between the doses corresponds to the number of decigrammes in the last injection. The first course gives a total dosage of about 5 grm., after which there is an interval of about two months. The second course may begin with a larger dose than

the first. It has the same intervals, but reaches the aggregate dose of from 3 to 4 grm. in a shorter time. Sanocrysin is contra-indicated with pronounced reactions such as fever, dermatitis, or albuminuria. When the injection causes a severe reaction the last dose or the one previous is repeated. Twenty-six cases with early infiltration were especially investigated, all with acute spreading disease. These patients responded well and gave such immediate and uniform results that Gravesen was satisfied that they clinically corresponded to Mollgaard's experimental results. In the large majority of patients where early and late phases of the disease are intermingled by combining sanocrysin and collapse treatment results were seen which could not have been obtained by either method alone, sanocrysin acting on the fresh disease, the older fibrocavernous changes being healed by collapse.

C. Shaw¹¹ gives sanocrysin in the following doses, 0.1, 0.25, 0.5, 0.75, 1, 1, 1 grm. at weekly intervals, but with modifications to suit individual patients. The phenomena common after a dose were found to be an evening rise of temperature, mild general constitutional symptoms, a transient gastro-intestinal disturbance, or a transient albuminuria. With a moderate dosage symptoms which might be interpreted as dangerous occurred only in a minority—that is, persistent albuminuria in one case and skin rashes in 3 out of 35. The result in this series was: much improved 9, improved 12, unaffected 9, and worse 5. The 9 much improved cases were all young, 7 being between 14 and 25, all but one gave a history of less than six months, all were febrile and toxic, and all had extensive bilateral disease. Despite these features, all were rendered fit for Grade A sanatoria in from three to six months. He concludes that cases of recent exudative disease, especially in young adults, yield the best results.

Diet.—Recent studies from Sauerbruch's surgical clinic urge the curative value of a base-forming dietary low in sodium chloride, protein, and carbohydrate, and rich in fats and vitamins. This diet, which has had much publicity in Germany, was introduced empirically by Gerson, and Sauerbruch maintains that inoperable bilateral cases of tuberculosis may now be treated with **Thoracoplasty** if the patients are first prepared by this dietary. The diet for a 60-kilo. patient contains 90 grm. of protein, 160 of fat, and 220 of carbohydrate. This gives an energy value of about 3000 calories. Salt and salted foods, smoked and preserved foods of all kinds are forbidden. Fresh meat is allowed up to 500 grm. a week (or 100 grm. a day for five days in the week); fresh fish, internal organs such as liver, wine, beer, coffee, and tea are allowed in limited quantities. Milk is given up to one or one and a half litres a day, cream, cheese, butter, fresh or cooked fruit, salads and fresh vegetables, salt-free bread, eggs, rice, sugar, honey, olive oil make up the bulk of the diet. Much of the diet consists of raw foods rich in vitamins. E. Mayer and I. N. Kugelmass¹² have studied 20 patients upon this diet. They were between the ages of 22 and 33, and all had far advanced tuberculosis and had failed to respond after two or three years of routine treatment. After six months 8 had gained substantially in weight, 10 showed considerable diminution of sputum but without loss of tubercle bacilli, 4 who had slight fever obtained a normal temperature, while 2 developed fever. Eight showed a definite clearing of the lungs; 2 with intestinal tuberculosis lost symptoms of this. Diminution of fatigue, of pains in the chest, and of alimentary disturbances were conspicuous. The acid-base equilibrium of the patients shifted towards the basic side, and this was in accord with similar studies made on rats. J. Mouzon,¹³ on the other hand, is very critical of the Gerson dietary. He points out that the tuberculous patient does not readily adapt himself to a salt-free diet and requires considerable persuasion, that some of the results may

be due to suggestion, and that it will be wise to wait before adopting the diet in sanatoria.

REFERENCES.—¹*Edin. Med. Jour.* 1930, March, 141; ²*Amer. Jour. Public Health*, 1928, July, 843; ³*Jour. Amer. Med. Assoc.* 1929, Nov. 9, 1460; ⁴*Ibid.* 1459; ⁵*Norsk Mag. f. Læge.* 1930, July–Sept.; ⁶*Brit. Med. Jour.* 1929, ii, 331; *Jour. Amer. Med. Assoc.* 1929, July 3, 108; ⁷*Beitr. z. klin. Tuberk.* 1923, lx, 526; ⁸*Canad. Med. Assoc. Jour.* 1929, Aug., 143; ⁹*Lancet*, 1929, ii, 60; ¹⁰*Tubercle*, 1930, Feb., 193; ¹¹*Practitioner*, 1930, April, 468; ¹²*Jour. Amer. Med. Assoc.* 1929, Dec. 14, 1856; ¹³*Presse méd.* 1929, Sept. 25, 125.

TUBERCULOSIS, PULMONARY, SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

Bérard and Lardennois,¹ in a communication to the Congress of the French Association of Surgery, give an account of surgical interventions for pulmonary tuberculosis. They divide them into two groups: (1) For the treatment of the pulmonary lesions themselves; and (2) With these lesions the treatment of pleural complications. They are in general agreement with all authors that the most favourable in the first group are those cases in which there is evidence of spontaneous retraction and fibrosis in the affected lung, associated with a good general resistance and a predominantly unilateral lesion.

Indications and Results.—The indications for thoracoplasty are primarily ulcero-fibrous long-standing lesions, unilateral and inactive, in which pneumothorax is not possible. The next best type is the fibro-caseous lesion, with slight pyrexia, or those causing hæmoptysis in which the general resistance is good. Another good group is that in which pneumothorax has been abandoned or incomplete. The period of choice is between the ages of 15 and 40 years. Cardiovascular insufficiency, dyspnoea, and cyanosis contra-indicate, as do renal, intestinal, and laryngeal complications. [With the last many surgeons—including the reviewer—do not agree, and only regard advanced laryngeal disease as a contra-indication.—A. T. E.]

For phrenicotomy, indications are somewhat similar, but wider in their scope, and bilateral disease may be benefited by operations on the more advanced side. The authors state that apical lesions are equally likely to respond to phrenicotomy as basal lesions. [This again is not in accordance with the general opinion, although quite good results are occasionally obtained in apical lesions.—A. T. E.] They advise phrenicotomy preliminary to all thoracoplasties.

The results of thoracoplasty were as follows: 98 patients were submitted to operation: 39 in one stage, 25 in several stages, and 34 had partial thoracoplasties. Very good results were obtained in 22 per cent, good results in 18 per cent, improved in 7 per cent—a total of 47 per cent ameliorations from operation. Operative mortality was 18 per cent, and late deaths account for a further 25 per cent. [The operative figure is much higher than those recorded in Germany, America, or this country.—A. T. E.] With regard to phrenicotomy: out of 300 cases the authors discuss 120 in which amelioration amounted to 41 per cent. Success was rare in the more acute forms of the disease. In the treatment of purulent tuberculous pleural effusions, the authors condemn repeated aspirations or injections owing to the tendency to the formation of sinuses in the chest wall with resulting secondary infection. Thoracoplasty is advised, with withdrawal of the fluid as collapse occurs. In secondarily infected effusions wide drainage is not undertaken if it can be avoided, but thoracoplasty is advised. Seven cases in which preliminary drainage was not undertaken were admitted to thoracoplasty, with 4 deaths, more or less rapidly after the operation; in 9 following preliminary phrenicotomy 2 post-operative deaths resulted. These results indicate the serious

outlook for cases with this complication and the necessity for collapsing operations at an earlier stage.

A. V. S. Lambert and F. B. Berry,² in a paper on thoracoplasty for pulmonary tuberculosis, emphasize the value of co-operation between physician and surgeon and the necessity for sanatorium after-care. Operation in stages has reduced the early mortality very considerably, and the first-stage operation on the upper ribs is advocated, as it increases the eventual collapse. Their indications correspond fairly closely with those of Bérard above, but they do not discuss tuberculous effusions, believing that, as the lung is already collapsed, a different problem is presented. The results are recorded in 100 cases divided into two groups—unilateral cases and bilateral cases. In the former group of 64 cases, 61 per cent are cured or improved; 11 per cent died later; and the operative mortality was 12 per cent. In the latter—comprising 36 cases—24 per cent were cured or improved; 25 per cent died later; and the operative mortality was 44 per cent.

H. Morriston Davies,³ in a paper on the use of surgery in pulmonary tuberculosis, discusses phrenicotomy, thoracoplasty, multiple intercostal neurectomy, and extrapleural pneumolysis. The indications for phrenicotomy are: (1) Basal tuberculosis; (2) Chronic basal effusions; (3) More generalized tuberculosis where pneumothorax has failed; (4) Relief of symptoms such as pain, dragging cough, and tachycardia; (5) As an accessory to artificial pneumothorax, either to release basal adhesions or to diminish the intervals between refills; (6) As a preliminary to thoracoplasty; and (7) As a prophylactic to prevent the late development of basal bronchiectasis in a case with unresolved basal pneumonia. The indications for thoracoplasty are in the main those of artificial pneumothorax, but the contra-indications are more serious. Pyothorax, if not easily controlled, should be submitted to thoracoplasty without undue delay. The presence of active disease in the other lung Davies regards as a definite contra-indication, except in the case of repeated hæmoptysis endangering the life of the patient. The value of Alexander's multiple neurectomy is not yet determined owing to paucity of experience. The author is not in favour of extrapleural pneumolysis for apical lesions, preferring localized thoracoplasty.

E. Archibald⁴ groups his patients into three classes: (1) Favourable cases—chronic fibroid tuberculosis, predominantly unilateral, with cavities no larger than a pigeon's egg, and without any sign of activity in the good lung. The disease has been present for two years or more and the patient is an adult in good general condition, apyrexial, and with positive sputum. (2) Doubtful cases—more extensive infiltration of the worse lung, with large and multiple cavities showing a tendency to progression. The good lung is under suspicion and may have shown activity within the previous year. Patients are not so fit in general as in the previous group, have lost weight, and are liable to pyrexial periods. (3) Unfavourable cases—the lesions are definitely progressive; cavitation is generalized in the whole lung. In the 'better' lung, evidence of more recent infiltration is seen. Pyrexia and other signs of mild chronic toxæmia are present. The signs of failure of resistance are beginning to be apparent. The results of thoracoplasties (exclusive of cases of mixed infective tuberculous pyothorax) were—*Group 1*: 24 cases with 16 practical cures; 4 greatly improved; 1 moderately improved; 1 death due to operation (1 death subsequently not due to operation). *Group 2*: 45 cases—17 practical cures; 8 greatly improved; 9 moderately improved; 2 stationary or worse; 3 deaths due to operation; 6 died later from this disease. *Group 3*: 21 cases—no practical cures; 3 greatly improved; 4 moderately improved; 8 deaths due to operation; 6 subsequent deaths from the disease.

A. Tudor Edwards⁵ reports results in 112 cases of pulmonary tuberculosis submitted to thoracoplasty. These include cases of tuberculous empyema, both tuberculous and secondarily infected. The total operative mortality was 4.5 per cent up to three months after operation, with 45.7 per cent fit for work and a further 25.6 per cent much improved. The causes of operative death were pulmonary embolism in one case, pneumonia in 'better' lung in three cases, and late heart failure in one case. In discussing tuberculous pyothorax, thoracoplasty is advocated if the condition of the contralateral lung permits. For the secondarily infected cases, in which drainage is generally required, this should be carried out in such a position as not to interfere with subsequent thoracoplasty, and pleurotomy is therefore advised in the anterior axillary line.

Anæsthesia.—Anæsthesia for thoracoplasty in pulmonary tuberculosis is discussed in a paper by I. W. Magill.⁶ The respective merits and demerits of local and general anæsthesia are described. Local anæsthesia has the advantage of causing no irritation of the lungs, no post-operative vomiting, and diminution of operative oozing. The disadvantages are the possibility of toxic absorption, greater tendency towards delayed healing from superficial infiltration, and the effect of extensive operation upon the mental condition of the conscious patient. Chloroform and ether he considers inadvisable from the effects of the former on patients who have long suffered from a certain degree of toxæmia, and the latter from its irritative effect on the lungs. Summing up, he considers **Gas-oxygen Anæsthesia**, associated with infiltration of the intercostal nerves with 1 per cent **Novocain**, the method of choice for these patients.

REFERENCES.—¹*Presse méd.* 1929, Oct. 12, 1332; ²*Ann. of Surg.* 1930, Jan., 57; ³*Brit. Med. Jour.* 1930, i, 687; ⁴*Canad. Med. Assoc. Jour.* 1929, Nov., 502; ⁵*Jour. of State Med.* 1930, Oct., 603; ⁶*Lancet*, 1930, i, 295.

TUBERCULOSIS, SURGICAL.

John Fraser, Ch.M., F.R.C.S.Ed.

As might be anticipated, the pediatric literature of the past year has contained numerous references to bone and joint tuberculosis.

POTT'S DISEASE.

Is an osteosynthesizing operation indicated in Pott's disease? The question is still the subject of discussion, and how sharp is the divergence of opinion may be appreciated by reading the papers of E. Sorrell and Rocher¹ in favour of the operation, and that of F. Calot² in condemnation of the procedure.

Sorrell and Rocher record their experience in 106 cases, and the paper affords a reasoned argument in favour of the operation in certain well-chosen cases. The authors draw a sharp distinction between spinal tuberculosis in the child and in the adult. In the former, healing is likely to be relatively complete, even in the extensive lesion, if conservative treatment is satisfactory; while in the latter the prognosis of natural cure under pure conservatism is much less hopeful. It is upon these generally accepted facts that the argument in favour of an osteosynthesizing operation is based.

An efficient graft has an obvious mechanical effect in supporting the posterior portion of the vertebral column, and in so far as it supports and immobilizes, it exerts a beneficial effect upon the progress of a tuberculous focus in the anterior segment of the column. The observers proceed to point out that, while it has this beneficial effect, it is folly to suppose that it exerts any specific biological effect, such as stimulating osteogenesis or increasing vascularity. Any benefit which the graft may have is purely of a supporting and immobilizing type; but, while recognizing its limitations, the authors are

satisfied as to the great value of osteosynthesis, and they add as their belief that "orthopædic treatment is incapable in itself of ensuring a cure". A graft operation of some type is preferable to the periosteal stripping operation of Hibbs, and they regard the rigid graft of Albee and the supple graft of Dingaria or Delezenne as equally good.

The operation is done at a time when the disease appears to be in a quiescent phase, and subsequent to the interference complete fixation is carried out for six months. The authors are fully convinced that the operation produces most satisfactory results, and in their opinion it is a procedure which permits a larger proportion of cases to return to active life than is possible under pure conservatism. The operation is said to reduce the disability percentage from 100 to 6.

Professor Calot writes with the authority of thirty-eight years' experience. He claims that he introduced the fixation operation in 1897—fourteen years before it was adopted by American surgeons—and that he has now abandoned it because he has found that purely orthopædic methods give results which are as good as, if not better than, those secured by operation. His objections to operation are that: (1) It does not shorten the period of conservative treatment; (2) It is associated with an appreciable mortality; (3) In general principles all sanguinary operations in the treatment of Pott's disease are more harmful than beneficial.

The technique of Calot's treatment is well known. It implies the application of a plaster jacket provided with an opening over the kyphosis, if this exists. Correction pressure is exerted over the kyphosis by the insertion of ten to twenty squares of wadding 1 cm. thick between the plaster jacket and the body surface. The wadding is renewed each week, and it is kept in place by a circular bandage of wet tarlatan. The plaster jacket is renewed every three or four months, and the total period of its application is about two years. For a further period of three years a removable plaster or celluloid jacket is worn.

Calot records the interesting observation that the development of *whooping-cough* in a child suffering from Pott's disease is a particularly dangerous complication because the repeated concussion effect of the cough stimulates the progress of the disease. It is claimed that treatment by a plaster jacket lessens the risk. Calot also claims to have secured correction of kyphoses of several years' standing, but the best results are naturally in early cases.

These two papers indicate the views of what may be called opposing schools, but there is no doubt that opinion favourable to operation in well-chosen cases is increasing.

The Treatment of the Paraplegia of Pott's Disease.—The treatment of this, the most distressing complication of Pott's disease, is discussed in a paper by R. Massart and R. Dierroquet,³ in which they describe the advantages of operation. They believe that abscess formation is the almost invariable cause of paraplegia, and they hold it to be essential that the abscess should be evacuated at the earliest opportunity. They assume that the abscess makes its way into the posterior mediastinum—an assumption which is not invariably correct; but this proviso forms the basis of their scheme of treatment, for they recommend that the posterior mediastinum be exposed by means of an **Osteo-transversectomy**, and that through this avenue the abscess be aspirated. One case is recorded; there was recovery of movement in three days, and relief has persisted for twenty months.

Osteo-transversectomy was in the past a favoured method of treatment in tuberculous prevertebral abscess formation, and the only novelty in the method just described is that aspiration is used instead of open drainage.

The modification is in keeping with modern ideas, but the record of a single case is insufficient material upon which to establish recommendation or criticism.

THE TREATMENT OF SURGICAL TUBERCULOSIS.

Intra-articular Injection of Zinc Sulphate.—Many observers have sought for a substance which, on being introduced into a tuberculous joint and so brought into contact with a diseased synovia, would exert an antibacterial influence by one means or another upon the infected tissue. M. V. Hedre¹ has been experimenting in this connection with sulphate of zinc. A 10 per cent sulphate of zinc in glycerin solution is employed; 2 to 3 c.c. are introduced at one time, and the injection is repeated after fourteen days; an average of six injections is required. The results of five cases so treated are recorded—three elbows and two wrists—four of these being reported as cured, while one died of general tuberculosis a year later.

This type of medicament has already been reported on in connection with glandular tuberculosis, cold-abscess formation, and fistula; moderately good results have been recorded. An intense local reaction follows the injection, and during this phase pain may be severe. The benefit of the method arises from its sclerosing effect upon tissues; its influence is therefore local and due to contact, and its value would appear to be restricted to cases of pure synovial tuberculosis, as it cannot be expected to exert any pronounced effect upon underlying bone lesions. A joint submitted to this treatment will almost of necessity become the site of a fibrous ankylosis.

The Treatment of Tuberculosis with Lipoids.—This is the subject of a paper by W. Drügg.⁵ The substance was administered orally, and it is stated that "in selected cases of surgical tuberculosis lipid preparations administered orally frequently produced increase of weight and sometimes reactionary appearances in the seats of disease". That the procedure is not devoid of risk is evidenced from the conclusion that, while an increased degree of immunity was apparent in 25 per cent of the cases, in 75 per cent the treatment proved ineffectual or even injurious. It is believed that the effect of a lipid therapy is on the basis of an antigen action, and that its influence is closely related to the considerable lipid content of the tubercle bacillus.

The Closed or Solieri Treatment of Open Tuberculosis.—This method of treatment has attracted considerable attention in Italian and German circles. It was introduced by Professor Solieri to the Italian Orthopaedic Congress in Florence in 1922. At that time six patients were exhibited, but the method met with considerable criticism. Since that date Solieri has published several papers dealing with the treatment and its results. His latest contribution⁶ is the one under review. The procedure consists in the correction of any deformity which may exist in the part under treatment, the sterilization of fistulae by the application of 5 per cent iodine, the establishment of free drainage in any localized collection of pus, and the complete encasement of the limb in a plaster case. Joints immediately above and below the affected part are included in the plaster application, and, as absolute immobilization is considered essential, the amount of cotton-wool padding is reduced to a minimum. The plaster is kept in place as long as possible; in fact, it is changed only when imperative. It is obvious that discharge must collect in the dressings, but it is interesting to notice that "the benefit of the method lies in the fact that there is an autovaccination by specific products of the tuberculous pus in contact with the broken skin around the fistula under the apparatus". The present article records the results of 32 cases,

principally hip- and knee-joints. Of these 24 are cured, 4 are *in statu quo*, and 4 died during the progress of the treatment.

The principles of the method are somewhat similar to those practised by Orr in connection with acute osteomyelitis, but it is none the less true that treatment of this kind has long been practised in connection with tuberculosis of bones and joints. Hitherto it has been thought neglectful to allow discharge to collect beneath a plaster, but according to Solieri there has been virtue behind the sin.

Bismuth Treatment in Surgical Tuberculosis.—This method of treatment is the subject of an interesting paper by A. Bonaccorsi.⁷ Two facts of general interest are pointed out: (1) That a systemic disturbance always accompanies a local tuberculosis; (2) That there is a certain parallel between surgical tuberculosis and the lesion produced by certain protozoan infections, more particularly the tertiary lesions of syphilis. From these facts it is adduced that drugs which are useful in syphilis should be of value in the treatment of tuberculosis, and after experimenting with various formulæ bismuth was chosen. A methyl arsenic bismuth (Bayer) is used, made up in a proportion of 10 cgrm. of the salt to 1 c.c. of water (distilled); 2 to 3 c.c. are given intramuscularly on five consecutive days, followed by ten injections on alternate days, and finally by ten injections every three or four days; one week elapses between each series.

TUBERCULOSIS OF THE LARGER JOINTS.

Hip-joint.—C. L. Pattison's⁸ paper on 300 cases of tuberculosis of the hip-joint was noticed in the MEDICAL ANNUAL of last year (p. 492). At that time a brief summary was the material from which the abstract was made. The complete paper is now available, and, as the results recorded are of remarkable merit, further details may be given.

The primary interest of the paper is in respect of results. In recording these, four groups have been created: (1) Perfect functional result; (2) Arrested disease, but some disability; (3) Recurrence of disease; (4) Death and hopeless cases. The scheme of treatment embraced the usual general remedies. The local treatment varied according to circumstances; in acute progressive disease there was immobilization on a Pyford frame with weight extension, and when the acute stage was past a decision was reached as to whether a movable or a fixed joint was likely to result, X-ray findings bulk- ing largely in the decision. If it seemed possible to retain mobility, weight extension was continued for three to six months, after which the traction was removed and the patient encouraged to move about in bed. If this degree of liberty was tolerated, the patient was regarded as convalescent and treated by a celluloid hip spica support, crutches, and patten. In the second group, that in which a fixed joint appeared to be inevitable, a double plaster spica was applied over the complete length of the limb on the affected side, to the knee on the opposite side, and kept in place until ankylosis appeared to be complete.

The results recorded are remarkable—it is doubtful if they have ever been surpassed. In the first group (perfect functional result, a full range of movement, no shortening, no sign of disease) 107 cases were placed—a percentage of 55.7. Equally remarkable is the fact that these results were obtained by a treatment period averaging one year and ten months. It seems essential for the achievement of this remarkable result that an accurate diagnosis should be made at an unusually early stage in the progress of the disease.

T. P. McMurray⁹ doubts the efficacy of extra-articular arthrodesis for the reason that he does not believe that extra-articular fixation arrests the spread

of the disease, and that, as the disease extends, the graft may ultimately be faced with the burden of bearing the entire tension and weight strain of the part. McMurray gives the composition of a preparation which he has found useful in the treatment of tuberculous sinuses. It is a medicated sawdust originally introduced by Thomas, and composed of pure sawdust treated with powdered perchloride of mercury, vegetable tar oil, and turmerene. The results of 53 cases are recorded, and no case in the series had been under treatment for a period of five years prior to examination. Bony ankylosis was present in 23 cases, and the author draws attention to the fact that a mixed infection was a factor common to all. In the remaining 30 cases some degree of limitation of movement existed, varying from a fibrous ankylosis, relatively complete, to a limitation which was only partial.

Any interested reader must be impressed by the variability which distinguishes end-results in tuberculous joint disease. The point is well demonstrated in the figures just recorded, where we find on the one hand a perfect result in 55.7 per cent of cases, and on the other "the constant feature of limitation of movement in the joint in every direction". The apparent anomaly is of importance; there must be an explanation, and its demonstration would surely be helpful.

Knee-joint.—The only paper on knee tuberculosis brought to our notice is by F. Pouzet¹⁰; the contribution deals with juxta-articular tuberculosis of the knee. Twenty-five cases are recorded, and the interesting fact emerges that when the disease appears in children below the age of three 75 per cent of the cases arise in the femur, while in an age period from the fourth to the fourteenth year 70 per cent are located in the tibia. No clear explanation of the site-age incidence is offered.

Allusion is made to the frequency with which synovial effusions occur secondary to the development of bone foci, and operation on the bone error is advised with a view to avoiding actual tuberculous infection of the joint cavity.

REFERENCES.—¹*Presse méd.* 1929, Oct. 16, 1349; ²*Monde méd.* Paris, 1930, Jan. 1, 1; ³*Presse méd.* 1929, Aug. 31, 1134; ⁴*Arch. f. klin. Chir.* 1929, Dec. 29, 583; ⁵*Deut. Zeits. f. Chir.* 1930, Feb., 392; ⁶*Policlinico*, 1929, xxxvi, 1064; ⁷*Ibid.* 1208; ⁸*Brit. Med. Jour.* 1929, ii, 532; ⁹*Liverpool Med.-Chir. Jour.* 1930, 82; ¹⁰*Lyon. méd.* 1929, July 14, 33.

E. W. Hey Groves, M.S., F.R.C.S.

The treatment of surgical tuberculosis has undergone a very marked change during the years of the present century. Following upon the Listerian era at the end of the last century it became the usual practice to perform an open operation upon all the accessible joints of the body which had been affected by tuberculous disease. Formal excision of the shoulder, elbow, hip, and knee was the routine method of treatment. Now this is all changed, and at the present moment conservatism is the order of the day. In this, as in all similar surgical problems, there is a tendency for the pendulum to swing too far towards one extreme and then to return towards the other. There is now considerable evidence that operative surgery still has a very useful place in the treatment of tuberculous joints, also that the exclusive use of conservative methods, particularly in adults, occupies an unreasonable time and gives an uncertain result.

Light Treatment.—The treatment of tuberculous conditions of the bones and joints by the action of the sun's rays has now been established in an impregnable position. It is now only necessary to study the modifications and limitations of heliotherapy and to inquire into the best substitutes for the sun's rays where these are not available.

W. M. Phelps¹ has made a careful study of this question. He draws attention to the fact that it is only that part of the spectrum at the violet end which lies between 320 and 380 $\mu\mu$ which has direct effect in the healing of tuberculosis. This healing effect is considered to be in the nature of a general improvement and acceleration in the process of repair rather than one of direct destruction of bacteria. One of the most remarkable and satisfactory evidences of the beneficial effect of light is that under its influence sinuses tend to heal. This healing takes place better when the light is applied to the body as a whole than when it is merely directed on the region of the sinus. The beneficial effects of the sun's light can be obtained by the use of a carbon-arc lamp of 25 ampères. The light rays which produce erythema and tanning are rather shorter than those which effect healing, being about 300 to 320 $\mu\mu$. If these shorter waves are cut out from the source of light, a longer exposure to it can be given than would otherwise be safe. According to this view the reaction of the skin by tanning cannot be taken as any index of the efficacy of the treatment. Phelps lays great stress upon the importance of measuring the dosage of sunlight used in treatment. He describes a method by which this can be effected, but it appears to us that this method, although of great value for scientific observation, is much too complicated to be of any value in clinical work.

K. Pardee² has studied in some detail the value of artificial sources of light as a substitute for the sun to be used on dark days and during the winter months. She records her observations in twenty-nine children for whom a carbon-arc light was used every day through the winter months. Her records show that in the great majority of these cases there was a definite improvement in the hæmoglobin content of the blood, the weight, and the calcification of the bones. She attaches great importance to accuracy of dosage. As a general rule the treatment is begun by an exposure of half a minute at a time applied to each side of the body. This is gradually increased until the maximum dose of fifteen minutes daily to each side of the body is achieved. Apart from scientific observation of changes in the blood and the bones, the most noticeable effect of the light treatment is seen in the great improvement in the children's energy. Usually they are listless and apathetic in the early stages of treatment, but later they become so lively that it is difficult to keep them quiet for the necessary exposure.

Bone-pegging in Tuberculous Joints.—For the past few years a great deal has been heard of an operative method in the treatment of tuberculous joints introduced by Robertson and Lavallo. This consists in driving living-bone pegs cut from the crest of the tibia into the affected ends of the bones. The underlying principle is that in a tuberculous bony focus a condition of hæmostasis with consequent atrophy exists, and that the insertion of the bone-grafts produces an acceleration of the arterial circulation which brings about repair. As in most new methods the claims made by its originators probably err on the side of optimism, whilst the objections of the critics are unduly pessimistic. Thus R. Nissen,³ who recently visited South America with Professor Sauerbruch to see and test the Robertson-Lavallo technique, gives only a qualified approval of it. He has carried it out in 12 cases, in which the hip, knee, foot, and elbow were affected. In 3 of these, namely, two of the knee and one of the ankle, surprisingly good results were obtained, the disease clearing up rapidly and the joints being restored to normal function, but in the remaining 9 the results were either negative or poor. It would seem from this that the method must be of some value and that its effective use will depend very largely upon the proper selection of cases.

Another operative procedure, which is intermediate between that of

Robertson-Lavalle and that of excision of the affected joint, is the driving of a bone-peg not only into the bone-ends, but right through the articulation itself. It would appear to us that such a procedure has only to be mentioned to be condemned, but as it has been seriously advocated by such well-known surgeons as Lexer¹ in Germany and Tuffier⁵ in France we cannot afford to dismiss it without discussion. Tuffier described the use of this method in ten cases of what he calls tuberculous osteo-arthritis affecting the sacro-iliac joint, the knee, or the ankle. Several bone-grafts are used and are driven obliquely right across the affected joint. The best results have been given in disease of the sacro-iliac joint, where there is, of course, no synovial cavity. But in the case of the knee, although temporary amelioration was produced, in three out of four subsequent resection was necessary.

Treatment by Paraffin Injections.—Many years ago the late Professor Rovsing advocated the treatment of chronic inflammation of the joints by the injection of vaseline, but this idea appears to have become quite obsolete. Now L. A. Rosen⁶ has done some very remarkable work consisting in the injection of paraffin or vaseline into tuberculous joints; based on a long series of experimental and clinical facts, one must admit that the method makes an irresistible claim for attention. The mineral oils paraffin or vaseline, when injected into the tissues, especially the synovial cavity of the joint, are very slowly absorbed. They exercise at first a mechanical action, in separating the inflamed synovial surfaces and in producing a hydrostatic distraction of the joint, but also it is claimed that they exercise a therapeutic effect similar to, but more lasting than, that which they produce upon inflamed skin or mucous membrane. He gives details of ten cases, all of them in adults and most of them affecting the knee or the hip. The case records certainly make very remarkable reading. In a typical case a woman of a little over twenty years with characteristic white swelling of the knee-joint is presented. She had had previous treatment for one or two years by heliotherapy, plaster, and extension. The exploring syringe removed 500 or 600 c.c. of pus, and in its place over 100 c.c. of vaseline was introduced. This, instead of causing great pain such as always results from the introduction of iodoform emulsion, gave immediate relief. The aspiration and introduction of vaseline was repeated two or three times at an interval of a month or six weeks, and at the end of a few months the joint was apparently restored to normal condition and function. In fact, the results of this method of treatment are so remarkable as to tempt one to dismiss them with sceptical disregard. Probably this would be quite unjust, and in properly selected cases it would seem that the method certainly ought to have a trial. In this country at any rate the number of cases suitable for its use will be very small. The treatment seems specially to be indicated for a tuberculous joint where the disease is confined to the synovial membrane and where tuberculous effusion has occurred without gross destruction of the joint and ligaments in an adult. A further criticism is that one would require to know the subsequent history of a patient treated by this method for some years afterwards.

REFERENCES.—¹*Jour. Bone and Joint Surg.* 1930, April, 253; ²*Ibid.* 270; ³*Arch. f. klin. Chir.* 1929, Nov., 736; ⁴*Lance, Bull. et Mém. Soc. nat. de Chir.* 1929, May 11, 626; ⁵*Presse méd.* 1929, July 31, 989; ⁶*Rev. de Chir.* 1929, No. 10, 723.

TULARÆMIA.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—The prevalence of tularæmia in Soviet Russia, where four epidemics have occurred since 1926, is emphasized by A. Roubakine¹ in an important review, and by G. J. Sarchi,² who draws attention to the large number of atypical cases for which medical advice is not sought. In each

epidemic the source of infection was always to be found in water-rats, whose skins are in great demand and are exported to all parts of Europe.

The first cases of tularæmia diagnosed in Norway are recorded by T. Thjotta³ in three men who had been hunting hares and developed the disease after an incubation period ranging from one to eight days.

G. M. Konkel⁴ reports a case of tularæmia contracted from a coyote (*Canis lestin*) in New Mexico, where twenty-one cases had previously been notified, but only one in which the disease had been contracted from this source. Konkel points out that as the coyote is frequently being hunted and trapped in New Mexico, it is a real source of danger in the transmission of the disease.

REFERENCES.—¹*Monthly Epid. Rep. Health Sect. League of Nations*, 1930, 1; ²*Zentralb. f. Bakteriöl.* 1929, cxiv, 1 Abt. Orig. 55; ³*Norsk Mag. f. Læge.* 1930, 224; ⁴*Public Health Rep.* 1930, 439.

TYPHOID FEVER. (See also PARATYPHOID FEVERS.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—According to the *Monthly Epidemiological Report of the League of Nations*,¹ although the incidence of typhoid fever has fallen considerably in a large number of countries since last century, the condition is still endemic in most parts of the world, and epidemics occasionally occur even in countries with excellent hygienic conditions—for example, in Hanover in 1926 (see MEDICAL ANNUAL, 1928, p. 501), Montreal and Hertfordshire in 1927 (*Ibid.*, 1929, p. 336), and Lyons in 1928. In countries with reliable statistics the case mortality ranges from 7 to 12 per cent. While in some countries, such as Germany, Austria, Sweden, and some parts of Soviet Russia, the decline in typhoid incidence is more or less continuous and regular, others, such as Bulgaria, Czecho-Slovakia, Esthonia, Finland, Greece, Italy, Poland, the Kingdom of the Serbs, Croats, and Slovenes, Switzerland, and a group of sixteen towns in Scotland, show a considerable decrease. In England and Belgium the typhoid morbidity has remained at the same low level for several years with little variation, while in Spain it has kept at a high level. In Africa there was a rise in Egypt and Tunis and a fall in Algeria, Tripoli, Cyrenaica, and Morocco in 1928. In the United States the decline in typhoid prevalence is remarkably rapid and continuous, though the case mortality is very high, possibly because deaths are more accurately recorded than cases.

In Germany an outbreak of over a hundred cases due to milk infected by a carrier is reported at Weissenburg, a small Bavarian town, by E. Eckstein² and G. Schad,³ and Koester⁴ records an outbreak of 94 cases with 19 deaths in an asylum at Bonn, where the origin of the epidemic was probably a carrier employed in the preparation of the meals, and the subsequent cases were due to contact infection.

In Russia S. B. Dubrowski⁵ records an epidemic of typhoid and paratyphoid due to faecal contamination of the water-supply at Rostow on the Don, which began at the end of April, 1926, and lasted until the end of the year. Of 241 cases which occurred between May and December, 217 were typhoid, 22 paratyphoid, and 2 unclassified. Of the deaths 90 per cent were among the typhoid cases, 9 per cent among the paratyphoid, and 1 per cent among the unclassified.

According to T. Canaan⁶ the occurrence of enteric fever in Palestine was not suspected until 1913, when Mühlens produced bacteriological and serological proof of its existence in that country. In a study of 358 cases observed between 1925 and 1928 Canaan states that more than a third of all the patients were in the first decennium, whereas in Europe and America the maximum incidence is between the ages of 20 and 30. Flies and contact infection

appear to play the principal part in the dissemination of the disease in Palestine, whereas water and vegetables are of secondary importance in this respect. The hygienic conditions among the country people and the poorer classes in the towns are still very primitive. The average enteric mortality throughout Palestine during the period 1925-8 was 8.77 per cent for typhoid and 4.3 per cent for paratyphoid.

The eighteenth annual report of the *Journal of the American Medical Association*⁷ on typhoid in the cities of the U.S.A. in 1929 with a population of more than 100,000 shows a continued decline in the disease. Not only was the typhoid death-rate in a city population of approximately 34,000,000 as low as 1.56 per 100,000, but the actual number of typhoid deaths (531) in this population was less than half the corresponding number in 1925 (1067).

P. T. Lantin and P. Ignacio,⁸ who record their observations on 3455 cases of typhoid fever, of which 2046 were males and 1409 females, admitted to the Philippine General Hospital between January, 1911, and October, 1927, state that the fatality-rate from the first to the third decade was about twice as high as that in Europe. The average mortality during the sixteen years was 19.2 per cent, the annual variations being from 7 to 28.1 per cent. While in temperate climates the fatality-rate increases as age advances, among the Filipinos after the third decade it decreases, no deaths at all being found after the age of 55.

ETIOLOGY.—C. Achard⁹ records a case of laboratory infection in a woman, age 24, who accidentally spilt and swallowed some unsterilized typhoid vaccine and developed fever and faetid diarrhoea two days later. In spite of administration of typhoid vaccine by mouth, the disease lasted for eighteen days, but no complications ensued. The short duration of the incubation period is characteristic of typhoid fever contracted in the laboratory, as in the case of Duflocq and Voisin of a pregnant woman, age 19, who swallowed a culture of *B. typhosus* with suicidal intent. The onset of typhoid occurred three days later, and recovery took place without a relapse or abortion. Owing to the risks attending manipulation of typhoid cultures Achard recommends that anti-typhoid inoculation should be made compulsory in laboratories where typhoid organisms are used.

H. E. Miner and F. C. Forsbeck¹⁰ report an outbreak of 28 cases of typhoid fever which occurred among 65 guests at a wedding breakfast from eating chicken salad which had been prepared by a typhoid carrier. Most of the attacks were severe and one was fatal.

G. Krogh-Lund¹¹ regards sledge-dogs as the cause of the spread of typhoid fever in Greenland. These animals devour the faecal matter of the inhabitants, many of whom are healthy typhoid carriers, and on examination show not only typhoid bacilli in their stools but also a positive Widal reaction, and post mortem typhoid bacilli in the gall-bladder and intestine as well as a slight degree of cholecystitis.

SYMPTOMS AND COMPLICATIONS.—The subject of *typhoid fever in infancy and childhood* has recently received attention from several writers. According to A. A. Weech and K. T. Chen,¹² out of 417 cases up to the age of 2½ years collected by Griffith and Ostheimer in 1902, 23 were congenital and 139 others occurred in the first year of life. The course of the disease at this age is much more variable than in older children and adults. Evidence of intestinal infection is often entirely lacking, and the disease may present only the features of a blood infection. The prognosis is generally more severe than in later years. Of the 139 cases collected by Griffith and Ostheimer, 77 died, 28 recovered, and in 34 the result was not recorded.

H. Mommsen¹³ records his observations on 73 cases of typhoid and paratyphoid in children up to the age of 14 years: 50 were boys and 23 girls; 8 deaths occurred—4 among the boys and 4 among the girls. Vigorous children were more frequently attacked than weaklings. According to Mommsen the enteric fever of children is characterized by a tendency to relapses, although the general condition is little affected during their occurrence.

J. Picot,¹⁴ who reports nine cases in children aged from 10 months to 3½ years, states that the clinical picture at this age is generally incomplete compared with that in the adult, the predominating symptom being persistent fever. Like Mommsen he emphasizes the frequency of relapses, and adds that the commonest complications of enteric fever in infancy are first bronchopneumonia, then acute meningitis, and lastly intestinal hæmorrhage and perforation.

A. Costa¹⁵ records two fatal cases of *ulcerative and membranous gastritis* in typhoid fever in women of 39 and 46 respectively, in whom the condition was first discovered post mortem, and emphasizes the rarity of gastric as compared with intestinal involvement in typhoid fever. In the first case, in addition to the presence of typhoid ulcers in the intestine, the necropsy showed three small ulcers involving the mucous and submucous coats of the lesser curvature of the stomach; no organisms were found. In the second case, in which there was a sudden fall of temperature followed by vomiting and intestinal hæmorrhage, the necropsy showed a greyish membrane starting from the lesser curvature and invading the anterior and posterior walls of the stomach. Numerous bacilli were found in the lesions, but their nature was not identified.

S. G. Giardina¹⁶ reports 4 cases of *appendicitis* in typhoid fever in patients aged from 17 to 20, 3 of whom recovered and 1 died after operation, and gives the following statistics of the frequency of this complication: 19 in 119 typhoid autopsies (Christian), 15 in 41 typhoid autopsies (H. Rolleston), 51 cases of perforation of the appendix among 949 cases of intestinal perforation in typhoid (Madelung). The mortality of cases operated on is about 75 per cent.

V. Rapant¹⁷ states that *empyema* is always a rare complication of typhoid fever in contrast with serous or serofibrinous pleurisy, which is relatively frequent. When it occurs it is usually secondary to a serous or serofibrinous pleurisy, and only rarely develops as a primary purulent effusion. Rapant reports a case in a man, age 25, which was exceptional in being primary. Recovery took place after drainage of the pleura.

E. May and H. Kaplan¹⁸ describe an *encephalitic form* of typhoid fever which is characterized by the following symptoms: (1) Hypertonus, which may affect the nuchal region so as to simulate meningitis, but is usually localized in the upper limbs, as can be found by passive flexion of the forearm on the upper arm. Tremors and involuntary movements like carphology probably belong to the same group of symptoms. (2) Involvement of the nuclei of various cranial nerves, giving rise to trismus, pharyngeal spasm, or ocular and laryngeal palsies. (3) Trophic changes, as shown by cachexia or cutaneous lesions. These manifestations, which as a rule are not accompanied by pyramidal or meningeal symptoms, usually do not appear till the second or third week of disease, and as a rule terminate fatally, probably from involvement of the medulla.

A. H. Baldwin and A. J. Bearey¹⁹ describe a form of typhoid fever occurring in North Queensland and remarkable for the fact that the patient's serum did not give a positive Widal reaction or only a weak reaction late in the disease. The existence of this form shows the importance of early blood cultures in tropical fevers.

PROPHYLAXIS.—H. Knorr²⁰ maintains that the duration of immunity conferred by typhoid inoculation has been underestimated. It is true that some persons are protected only for a short time, but in the majority of cases the immunity lasts for as long as five to seven years, and in some considerably more.

Owing to the greater frequency of typhoid fever since the War among children as well as in women compared with men and their much milder reaction to inoculation, J. Hesse²¹ suggests that all children after their third or fourth year should undergo subcutaneous injection with T.A.B. vaccine, which might be carried out at the same time as immunization against diphtheria with anatoxin. It is particularly important that children in the environment of enteric cases should be inoculated as well as those living in an infected area. Inoculation, at least by the subcutaneous route, is contra-indicated in weakly children, and in those suffering from acute infections or cardiac, renal, or hepatic insufficiency. Although the duration of the immunity often exceeds two years, re-inoculation by mouth or the subcutaneous route should be carried out every two years, especially as repetition of oral inoculation does not cause a violent reaction.

In view of the frequency with which the crews of merchant vessels contract typhoid fever, which is often of a severe and fatal character, in foreign ports, L. Bernard²² recommends that anti-typhoid inoculation of such men should be made compulsory like vaccination against small-pox, and that re-inoculation should take place every ten years.

TREATMENT.—A. Rodet²³ states that his **Serum**, which has been employed in recent years in France and Algeria and to a less extent in Spain and Latin America, is obtained from horses immunized by intravenous injection of broth cultures of typhoid bacilli. The mortality among 665 cases treated by this serum in the course of five years was only 7.33 per cent, and was nil in cases which came under treatment before the sixth day of disease. On the other hand, Bertoye and P. E. Martin²⁴ from their experience of the serum in children, and P. P. Ravault and D. Modrin²⁵ in adults, are agreed that it is unnecessary in mild cases and of no benefit in severe attacks, while it has the disadvantage of giving rise to severe serum sickness.

K. Kyriazides, C. Pekakis, and P. Calogerou²⁶ treated 251 cases of typhoid fever by Vincent's anti-typhoid **Vaccine**, which was given intravenously in 112 and subcutaneously in 139. They claim that it shortened the duration of the disease and lowered the mortality, the death-rate being only 7.14 per cent in cases treated by the intravenous method and 7.91 per cent in those injected subcutaneously. No control series, however, was used.

M. Tapia and P. Aznar²⁷ report eleven cases of typhoid fever in patients aged from 10 to 34 in which the course of the disease was in no way affected by anti-gangrene serum, as recommended by Weinberg (see MEDICAL ANNUAL, 1929, p. 506), owing to the association of anaerobic organisms, especially *B. perfringens* with *B. typhosus*.

REFERENCES.—¹*Monthly Epidem. Rep. League of Nations*, 1929, 155; ²*Münch. med. Woch.* 1930, 710; ³*Ibid.* 712; ⁴*Arch. f. Psychiat.* 1929, lxxxvi, 587; ⁵*Zentralb. f. Bakteriöl.* 1929, I Abt. Orig. cxliii, 225; ⁶*Deut. med. Woch.* 1929, 1375; ⁷*Jour. Amer. Med. Assoc.* 1930, xciv, 1574; ⁸*Amer. Jour. Med. Sci.* 1929, clxxviii, 32; ⁹*Bull. Acad. Méd.* 1929, cii, 278; ¹⁰*New Eng. Jour. Med.* 1929, cc, 440; ¹¹*Comptes rend. Soc. de Biol.* 1930, ciii, 615; ¹²*Amer. Jour. Dis. Child.* 1929, xxxviii, 1044; ¹³*Monats. f. Kinderheilk.* 1929, xlv, 331; ¹⁴*Thèse de Paris*, 1929, No. 234; ¹⁵*Riforma med.* 1929, 1484; ¹⁶*Giorn. med. Osp. Civ. di Ven.* 1929, 155; ¹⁷*Med. Klin.* 1930, 427; ¹⁸*Bull. Soc. méd. Hôp. de Paris*, 1929, Nov. 4, 1228; ¹⁹*Med. Jour. Australia*, 1929, i, 659; ²⁰*Arch. f. Hyg.* 1929, ci, 369; ²¹*Arch. Méd. Enf.* 1929, 729; ²²*Bull. Acad. Méd.* 1930, ciii, 195; ²³*Paris méd.* 1929, ii, 81; ²⁴*Jour. de Méd. de Paris*, 1929, 742; ²⁵*Ibid.* 1930, 312; ²⁶*Bull. méd.* 1929, 1057; ²⁷*Med. Ibera*, 1929, 405.

TYPHUS FEVER.*J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—According to the *Monthly Epidemiological Report of the League of Nations*¹ typhus with rare exceptions is tending to disappear. Europe is still the principal centre of the disease, as it always has been. In 1928 there were 35,569 cases in Europe as compared with 2735 in Africa and 1964 in Asia. At the present time the two principal endemic foci of typhus in Europe are Soviet Russia and Poland, though there has been a considerable decline of the disease in both countries in recent years. Roumania is the only other European country with an important epidemic focus, while less considerable foci are present in Bulgaria, Lithuania, and Jugo-Slavia. In Africa the principal foci are in the northern part of the Union of South Africa and in North Africa, especially Algeria, Morocco, and Egypt. In Asia the only important endemic focus is Chosen, where 1023 cases with 51 deaths occurred during the first half of 1929. An attenuated form of typhus is endemic in the United States, being mainly prevalent along the Atlantic Coast and in Mexico. A still more important focus is Chili, where in certain years the incidence was almost as high as in Russia and Poland. No cases, however, have been reported in Chili since 1927. In Australia, examples of a mild disease, resembling typhus clinically and epidemiologically but differing from it in not being louse-borne, have been reported (*see MEDICAL ANNUAL*, 1927, p. 511; 1929, p. 507).

H. Pinkerton² maintains that European typhus is essentially identical with Mexican typhus on the following grounds: Intraperitoneal inoculation of guinea-pigs with European typhus occasionally produces a scrotal reaction similar to that seen in Mexican typhus, though less pronounced and rarely demonstrable during life (*see MEDICAL ANNUAL*, 1930, p. 535). Moreover, in the gelatinous exudate on the tunica vaginalis Rickettsia-like organisms similar to, and probably identical with, those described by Mooser were found, and were indistinguishable morphologically and in their staining capacity from those found in smears from the gut of the European typhus louse. Pinkerton also found that infection with Mexican typhus protected a guinea-pig against infection with European typhus, while guinea-pigs which had recovered from European typhus were immune to Mexican typhus.

J. W. Wolff³ records twenty-nine cases of tropical typhus which recently occurred in the Dutch Indies.

ETIOLOGY.—As the result of experiments on guinea-pigs, H. A. Reimann and P. Y. Liu⁴ found that the typhus virus was absent from the sputum, saliva, and urine of typhus patients.

R. R. Spencer and K. F. Maxey⁵ investigated the Weil-Felix reaction in forty cases of Rocky Mountain fever in various stages of the disease with antigens prepared from the X19 and X2 strains O and H of proteus bacilli. Although it was not so constant in Rocky Mountain fever as in typhus, a positive Weil-Felix reaction undoubtedly occurred in most of the cases late in the disease or in convalescence. In neither Rocky Mountain fever nor in endemic typhus was the titre consistently higher with the O type, which is specific for typhus, than with the H type. Although the two diseases are clinically similar and the Weil-Felix reaction may be positive in both, Rocky Mountain fever and typhus are immunologically distinct, neither virus protecting animals recovered from one disease against subsequent inoculation with the virus of the other. The etiological agents, therefore, of Rocky Mountain fever and typhus appear to be biologically distinct though closely related.

SYMPTOMS AND COMPLICATIONS.—F. Toullec⁶ points out that, though the varieties of typhus do not possess an etiological, serological, or epidemiological similarity, they present a striking clinical uniformity owing to the constancy

of the following triad: (1) A temperature keeping at a high level for two weeks and then falling by lysis; (2) An eruption composed of maculopapular and sometimes petechial elements; and (3) A typhoid state of varying intensity. This syndrome is constantly found in true typhus, Rocky Mountain fever, Japanese river fever, the eruptive fever of the Marseilles district, the *fièvre boutonneuse* of Tunis, and tropical typhus. The intermediate host is the louse in the case of typhus, the tick or larva of the tick in Rocky Mountain fever, Japanese river fever, the Marseilles and Tunis eruptive fevers, and some forms of tropical typhus.

A. A. Koltypin,⁷ who records his observations on 600 cases of typhus in children, illustrates the mild character of the disease in childhood by the fact that no death occurred among them with the exception of one patient who contracted typhus just as he was recovering from relapsing fever.

PROPHYLAXIS.—Koltypin⁷ states that in addition to delousing the patients and prohibiting visits, 90 members of the staff of the children's hospital in which the epidemic occurred were inoculated with typhus blood taken at the height of the disease, with the result that only 7 (7.7 per cent) contracted typhus as compared with 32 (13 per cent) among 246 who had not been inoculated.

REFERENCES.—¹*Monthly Epidem. Rep. League of Nations*, 1929, 475; ²*Jour. of Infect. Dis.* 1929, xliv, 337; ³*Geneesk. Tijds. v. Nederl. Ind.* 1929, 429; ⁴*Nat. Med. Jour. China*, 1929, 440; ⁵*Public Health Rep.* 1930, 440; ⁶*Bull. Soc. de Pathol. exotique*, 1930, 152; ⁷*Jahrb. f. Kinderheilk.* 1929, exxiii, 27.

ULCERATIVE COLITIS. (See COLITIS, ULCERATIVE.)

ULCERS. (See also VARICOSE VEINS.)

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

S. P. Reimann,¹ acting on the researches of Hammett on the action of the sulphhydryl group (SH-) on stimulating cell mitosis, has been using a preparation, 'Thiocresol', which is a sulphhydryl attached to cresol, as a dressing in various types of chronic ulcer. The preparation, *p*-thiocresol, is prepared by the Eastman Kodak Co., and is insoluble in water. For use $\frac{1}{100}$ grm. is dissolved in 5 c.c. of 95 per cent alcohol, to which is then added 100 c.c. of distilled water, making a solution of 1-10,000. This has been applied as a wet dressing to a number of stubborn ulcers with success. It is found that granulations grow faster than epithelium, so much so that they 'flow over' the edges of the wound. This was remedied by carefully destroying exuberant tissue with a stick of **Silver Nitrate** and then dissolving the débris by applying a suspension of **Pepsin** for about two hours. After the wound has been washed with physiological salt solution, further applications of thiocresol are made. Thus the epithelium is continuously stimulated and allowed to grow unhindered, while the granulations are kept at the proper level. It is best to apply the dressing in periods of forty-eight hours' duration, and in the intervals to apply dressings of physiological salt solution. The solutions must be freshly made.

Varicose Ulcers.—A. Dickson Wright² has made a considerable advance in the methods of treating varicose ulcers by studying especially the hydrostatics of the condition. He shows that the pressure in a varicose vein may reach 170 mm. of mercury, that is, 30 mm. greater than the arterial blood-pressure. As a result blood from the capillaries cannot find its way into the superficial veins against such tremendous pressure. The result is stagnation, and from this all the complications of varicose veins arise. His solution to this problem consists of **Strapping** the leg with a considerable degree of compression. This method of strapping differs entirely from the older methods, and is used not primarily to protect the ulcer, but to squeeze the fluid out of the

tissues and to take off the venous pressure. The technique consists of winding sticking plaster very tightly round the leg, with a pressure proportionate to the amount of induration and œdema present, at weekly intervals. Each time the plaster is removed, visible veins are injected. When the ulcer is healed, injections generally have to be given until all the veins are completely thrombosed. When the œdema is completely expelled, a gelatine stocking is applied for a varying length of time until the leg loses its tendency to swell. The author claims that with this treatment he can promise the patient: (1) To cure any ulcer, no matter of how long standing or to what extent adherent to bone, at the rate of one square inch a week; (2) To relieve all pain; (3) To allow full work and exercise; (4) To eliminate the possibility of recurrence in nearly every case. The cases demonstrated by him seem to bear out most of his contentions. He explains the failure to get similar results with the well-known Unna's dressing by the fact that it is not possible to obtain sufficient pressure. A special strapping-bandage suitable for use in these cases has also been devised. A particularly interesting point is the fact that pain is almost immediately relieved and the patient need not cease work. The author points out that, though rest in bed will eventually cause these ulcers to heal, the pain is at first often made very much worse.

R. A. Cutting³ describes a method of treating varicose ulcers with an **Unna's Paste Boot**; the method of application is described in detail.

REFERENCES.—*Jour. Amer. Med. Assoc.* 1930, May, 1369; *Proc. Roy. Soc. Med.* 1930, May, 1032; *Amer. Jour. Surg.* 1930, April, 743.

UNDULANT FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

DISTRIBUTION AND ETIOLOGY.—A number of further studies have been made in the United States of the *Brucella melitensis* and *B. abortus* types of undulant fever. Thus, C. W. Wainwright¹ reports that the first-named variety is confined to goat-raising areas and is largely an occupational infection, but abortus infections are widespread and more prevalent than was formerly thought. The melitensis cases show more constant and typical fever and pain in the back of the neck, constipation, swellings of joints, and orchitis. W. M. Simpson and E. Fraizer,² with an experience of 63 abortus cases in Ohio, think the disease is increasing rapidly in the United States owing to infection by unpasteurized milk; for in five cases in which the organism was recovered from the blood of patients it was serologically identical with strains recovered from the cow's milk which the patients had consumed, while the blood serum of five women who had aborted agglutinated the *Brucella* organisms in high dilutions. The intradermal test promises to prove of considerable diagnostic value. A. V. Hardy³ states that abortus infections cause important economic loss but a low death-rate, and epidemiological data based on over one thousand recent cases indicate cattle and hogs with contagious abortion as the source of infection, but further study is required before effective methods of control are determined. W. L. Bierring⁴ has studied 150 cases in Iowa with 3 deaths and a duration varying from three weeks to one year. There is no reliable treatment, which must be symptomatic.

H. L. Moss and Mary A. Poston⁵ cultivated a *Brucella* strain thirty-six times from the stools of a chronic undulant fever case on eosin-methylene blue plates inoculated with a repeatedly centrifuged and washed suspension of stool diluted with immune serum to 1-100, and a porcine *B. abortus* from the stool of another case. M. J. King⁶ states that about 20 per cent of raw milk in the United States is infected with *B. abortus* of bovine origin, and pigs are another source of infection, milk and direct contact with infected animals being the causes of infection. Universal pasteurization of milk is advised.

M. J. King and D. W. Caldwell⁷ hold that individuals with lowered resistance may develop agglutinins in their blood serum, with or without clinical signs of undulant fever, after drinking raw *Brucella*-infected milk. Of 851 persons in a sanatorium using raw milk 91 (9 per cent) showed agglutinins when their sera were diluted 1-15 or over, and 24 agglutinated up to 1-45 to 1-3200 dilutions, which is considered to be evidence of infection with *B. abortus*. *B. abortus* agglutinins in the blood of cows do not prove whether the cows are discharging the organisms in their milk, although they may be eliminated in small numbers in the milk for years.

In a joint discussion on this subject at the Royal Society of Medicine⁸ W. Dalrymple-Champneys summarized the recent advances and the methods in use for eliminating the abortus infection from herds of cattle, and he favoured the separation of reactors by the agglutination test rather than by the immunizing of the cattle by live vaccines. L. P. Hugh, however, holds that there is no evidence that abortus carriers will be more numerous after vaccination than after the natural disease, and that the elimination of reactors to the agglutination test is economically impracticable; but live vaccination in non-pregnant animals prevents abortion with its high infectivity, and so tends to protect human beings from dangerous mass infection. J. T. Duncan in the same discussion dealt with the bacteriological side, and expressed the hope that it would soon be possible to differentiate the abortus from the melitensis organism. M. Ascoli and E. Sanfilippo⁹ once more maintain, contrary to the general opinion, that goats can be immunized against *B. melitensis* by vaccines.

CLINICAL.—A. S. Giordano¹⁰ has confirmed the value of Burnet's intradermal reaction following the injection of from $\frac{1}{2}$ to 2 c.c. killed *B. abortus* 1-1000 suspended in salt solution. In twelve to forty-eight hours a positive reaction is shown by local redness and heat with induration, which may develop into a sterile boil. A positive result was obtained in 25 consecutive *Brucella* infections and in only one of 100 controls. W. A. Griffin¹¹ thinks that definite intestinal lesions and even ulcers occur in undulant fever, and he advocates intensive **Heliotherapy**. B. M. Baker¹² isolated *B. melitensis* from the fluid of arthritis of the knee-joint in a case of *B. abortus* infection, and the symptoms cleared up after the administration of *B. melitensis* **Vaccine** and the serum of a recovered undulant fever patient. W. J. M. Simpson and L. G. Bowers¹³ point out that undulant fever may be confused with appendicitis and cholecystitis, and that genito-urinary complications requiring surgical treatment are common. H. Vignes¹⁴ discusses undulant fever in relation to human obstetrics, and concludes that up to now the *B. abortus* has not been proved to cause abortion in women. W. P. MacArthur¹⁵ reports a case of abortus fever in England in which the causative organism was cultivated from the urine. T. Zammit and J. E. Debono¹⁶ report partially successful immunization of goats in Malta by means of both *B. melitensis* and *B. abortus* by spraying the dead organisms over the mammæ and into the mouth and injecting them subcutaneously.

REFERENCES.—¹*Johns Hopkins Hosp. Bull.* 1929, Sept., 133; ²*Jour. Amer. Med. Assoc.* 1929, Dec. 21, 1958; ³*Ibid.* Sept. 21, 891; ⁴*Ibid.* 897; ⁵*Ibid.* July 20, 170; ⁶*New Eng. Jour. Med.* 1929, Nov. 7, 918; ⁷*Amer. Jour. Med. Sci.* 1929, July, 115; ⁸*Proc. Roy. Soc. Med.* 1930, Feb., 559; ⁹*Jour. Trop. Med. and Hygiene*, 1929, Oct. 15, 289; ¹⁰*Jour. Amer. Med. Assoc.* 1929, Dec. 21, 1957; ¹¹*New Eng. Jour. Med.* 1930, Feb. 13, 324; ¹²*Arch. of Internal Med.* 1929, July, 128; ¹³*Amer. Jour. Surg.* 1929, Nov., 597; ¹⁴*Presse méd.* 1929, Sept. 21, 1236; ¹⁵*Brit. Med. Jour.* 1930, i, 858; ¹⁶*Lancet*, 1930, i, 1343.

URETER, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

Ureteral Calculi.—J. B. Deaver and V. G. Burden,¹ discussing the surgical management of stone in the ureter, state that the size of the stone, unless it is more than 2 cm. in diameter, does not influence materially the procedure to be adopted for its removal, viz., by operation, or by ureteral dilatation through the cystoscope. A small stone, difficult to detect by X-ray examination, may lead to complete obstruction by reason of surrounding oedema, and such a stone may be difficult to find at operation. In such cases it is advisable to insert, if possible, a small ureteral catheter beyond the stone to relieve obstruction, and to allow it to remain in position for forty-eight hours, when the inflammatory reaction around the stone will have subsided. The ureter may then be dilated by a series of graduated catheters. Multiple stones in the same ureter should be removed surgically. Cases of stone in both ureters, or stone in one ureter with a lesion in the opposite kidney, must be carefully and fully investigated. Usually the side presenting acute symptoms should be dealt with first, but in the absence of a difference in the degree of symptoms on the two sides, the side having the better function should be dealt with first. As a rule, in the presence of obstruction of the lower urinary tract—as, for example, in cases of enlarged prostate—if there is much residual urine, cystotomy or prostatectomy should precede any attempt to correct a lesion of the upper urinary tract. A stone should not be allowed to remain in the ureter after nephrectomy because of the likelihood of a persistent fistula and disability from continued infection in the stump. Many cases of this type call for subsequent operation.

Of 113 patients with stone in the ureter, 66 were operated upon and 47 were treated by cystoscopic methods. In 98 the stone was in the lower ureter, a situation favourable for cystoscopic manipulation. When a stone has remained for some time in the upper ureter, usually at the uretero-pelvic junction, it becomes fixed and leads to rapid impairment of the renal function. Cystoscopic manipulations are of little use in these cases, and operative measures are called for. Should a stone be located in the upper ureter and the symptoms be mild and of short duration, a reasonable period for its descent and possible spontaneous passage should be allowed. Should a stone lodge in the middle third of the ureter, the procedure to be adopted for its removal will depend upon the acuteness of the symptoms and the condition of the kidney above it. If obstruction is not complete and the degree of infection not severe, cystoscopic manipulations may be tried, though they are often unsuccessful, but surgical removal is to be preferred as being certain and attended by less risk.

H. C. Bumpus, jr., and G. J. Thompson² have analysed 1001 cases in which a diagnosis of stone in the ureter was made at the Mayo Clinic from 1919–27 inclusive. Pain originating in the renal area and radiating towards the bladder was noted in 634 cases, but only exceptionally did it radiate to the inner side of the thigh or to the genitals. In 37 cases radiation was reversed, occurring from the bladder towards the kidney, and in these cases the stone was located in the lower ureter. Pain in the lower right quadrant of the abdomen, without radiation, and with little to suggest renal colic, occurred in 138 cases. In 37 of these cases the appendix had been removed without relief of symptoms. In 162 cases the pain was entirely epigastric and cholecystitis had been diagnosed. In 17 cases a diagnosis of peptic ulcer had been made, but subsequently ureteral calculi were discovered. The frequency of reflex gastric symptoms was shown by the fact that nausea and vomiting occurred during attacks in 304 cases; 456 cases had marked frequency and 254 had no urinary disturbance. Many gave a history of frequency and slight dysuria associated with vague abdominal pain without colic, and routine urological investigations in these cases led to the discovery of calculus in the ureter. Hæmaturia, obvious to

the patient, occurred in 300 cases and was found microscopically in 57 cases. In 27 cases anuria occurred, in 22 of which it was evidently reflex in type, since no demonstrable obstruction was found in the opposite ureter. The reflex anuria did not last more than twenty-four hours in any case, so that anuria of a longer duration is probably due to an actual obstruction.

Of recent years the popularity of the diagnosis of stricture of the ureter as an explanation of all symptoms led its originator to include the formation of urinary calculi among the other harmful effects for which he holds such strictures to be responsible. In view of the fact that strictures of the ureter are said to be more common in females than in males, because of the incidence of pelvic infection to which the former are subjected, it is worthy of note that 70 per cent of the patients of this series were males. A further observation that would seem to discredit the part played by stricture as an etiological factor is the incidence of recurrence in this series. In 32 cases the stone recurred in the same ureter, and in 30 in the opposite ureter.

W. P. Hogarth,³ on the basis of 40 cases of ureteral calculus in 36 patients, treated by cystoscopic manipulation, states that ureteral calculi, whether single or multiple, and up to at least 1 cm. in diameter, may be treated safely by dilatation of the ureter, which will result in the passage of the majority of the stones. Twenty-three patients had 1 dilatation, 6 had 2 dilatations, 6 had 3 dilatations, 2 had 4 dilatations, 1 had 5 dilatations, and 2 are still under treatment. Hogarth considers that the danger of infection in such cases is over-emphasized, and, as recurrence of stone is fairly frequent, the production of the passage of the stone by manipulation is a safer and more rational procedure than open operation, and is a step towards the conservation of renal function.

W. S. Pugh⁴ considers the following to be the indications for operation for stone in the ureter: (1) When the stone is large and seems to be stationary in the ureter; (2) When there is distension of the kidney as the result of the presence of the stone; (3) When there is reflex anuria; (4) When other diseases contra-indicate long attacks of pain; and (5) When the patient cannot, without severe reaction, withstand the cystoscopic examination. In a series of 123 consecutive cases of ureteral calculus the writer reports that 102 passed spontaneously after treatment with ureteral dilators; and of 207 consecutive cases operation was necessary in 7. He considers ureteral calculus to be the result of obstruction together with infection, and that the *Bacillus proteus* is one of the most important factors in stone formation. Many ureteral calculi pass spontaneously, but when impaction occurs the most common site is the lower third of the ureter. Hematuria and pyuria are present in almost all the cases, and in about 95 per cent of cases the calculus is solitary.

I. R. Junkelson⁵ states that reflex disturbance of the alimentary tract, even to the extent of paralytic ileus, may result from the presence of a ureteric calculus, with or without renal colic. He reports four cases of ureteric calculus in which this occurred, although renal colic was absent.

Uretero-ureteral Anastomosis.—W. S. Bump and S. M. Crowe⁶ report the results of end-to-end uretero-ureteral anastomosis in the ureters of 6 dogs examined 19, 22, 31, 56, 64, and 270 days respectively after division and suture, with exclusion of urine from the site of repair. The suture lines were found to have healed without narrowing or appreciable dilatation of the lumina, with a minimum of scar formation, without obvious change in the renal pelvis, and without evidence of any appreciable damage to the kidney. Ten months after a similar operation in a woman the ureter was found to be very slightly dilated, with the renal pelvis and calices not appreciably altered.

Transplantation of Ureters.—R. C. Coffey⁷ describes his technique for the submucous transplantation of ureters into the large intestine, and reports the

results in twenty cases. Special reference is made to the application of this operation in cases of cystectomy for carcinoma of the bladder. (See also **BLADDER, SURGERY OF.**)

REFERENCES.—¹*Ann. of Surg.* 1930, Jan., 85; ²*Surg. Gynecol. and Obst.* 1930, Jan., 106; ³*Canad. Med. Assoc. Jour.* 1929, Oct., 400; ⁴*Med. Jour. and Record*, 1930, June 4, 548; June 18, 608; ⁵*Ibid.* May 7, 468; ⁶*Surg. Gynecol. and Obst.* 1929, Sept., 346; ⁷*Jour. Amer. Med. Assoc.* 1929, Nov. 16, 1529; 1930, May 31, 1748; ⁸*Ann. of Surg.* 1930, June, 908.

URETHRA, RUPTURE OF.

Sir John Thomson-Walker, F.R.C.S.

There are three situations of rupture of the urethra: rupture of the pendulous portion, of the bulbous portion, and intrapelve rupture. Of these by far the most common is rupture of the bulbous portion, and C. C. Higgins¹ reports twelve cases of rupture in this part of the urethra. Hæmorrhage from the external meatus always occurs, but the degree of hæmorrhage is no indication of the extent of the rupture. It may be so profuse as to call for transfusion even when the urethra is only partially ruptured. Inability to pass water immediately after the injury is a frequent symptom, and is due to contraction of the lacerated urethra and spasm of the compressor urethræ muscle. Later on congestion, the development of a hæmatoma, and the onset of infection and extravasation, are all factors leading to retention. Owing to the fact that reflex spasm of the compressor urethræ muscle prevents extravasation for a few hours, and as a result of earlier diagnosis, extensive extravasations are not as common now as in the past. When the rupture is incomplete the writer is in favour of the use of an indwelling catheter alone with regular dilatation at a later date, and he believes that, if possible, perineal section should be avoided in such cases. If infection supervenes, or it is found to be impossible to pass a catheter into the bladder, then perineal section is necessary. For complete rupture of the urethra the writer performs perineal section with end-to-end anastomosis over a catheter, which is then tied in. In cases of intrapelve rupture of the urethra he considers that suprapubic cystotomy should be performed as soon and as rapidly as possible. Forty-eight to seventy-two hours after the preliminary cystotomy a retrograde catheter is passed from the bladder to the perineum and cut down upon in the latter situation. The catheter is then drawn onwards to the external urinary meatus, and tied in so as to act as a splint until the cut ends of the urethra unite. Fortunately, the membranous portion of the urethra, in contrast to the bulbous portion, shows but little tendency to stricture formation.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1930, March, 639.

UTERUS: CHRONIC CERVICITIS.

Beckwith Whitehouse, M.S., F.R.C.S.

The last few years, and particularly the last twelve months, have witnessed notable advances in our knowledge of inflammatory and infective lesions of the cervix uteri, and the important relation that chronic cervicitis bears to the health of the individual.

K. V. Bailey¹ has published the results of an exhaustive inquiry into the pathology of cervicitis and the bearing which it has upon cervical cancer. His work, based upon the histological examination of 850 specimens of the cervix uteri from St. Mary's Hospital, Manchester, places the pathology of so-called cervical erosion upon a sound pathological basis. Bailey joins with other authors in an attack upon the old nomenclature, and regards the term 'erosion' as being entirely erroneous and purely a 'clinical nickname' handed down from the days when gynecological morbid anatomy was by no means as advanced as it is to-day. The pathology of cervical erosion determines its

etiology, according to Bailey, entirely from an infective or irritative source. An inflammatory reaction of the tissues is always present, and therefore the term 'cervicitis' is the only applicable one, even for the erosions seen in the virgin and termed by Moench 'congenital pseudo-erosions'. Bailey, from his observations, asserts that the correct nomenclature in the group of cases hitherto known as proliferative erosion is *peri-oricular cervicitis*, that the ulcerative erosions should be termed *ulcerative cervicitis*, and that infection limited to the cervical glands is properly termed *glandular cervicitis*.

The actual lesion is produced by the effect of the inflammatory reaction locally applied in the region of the external cervical os for varying lengths of time, and by the reaction of the tissues to it. The ultimate sequel to erosion is malignancy, and in a series of microscopic preparations Bailey shows that the relationship of chronic cervicitis to cancer of the cervix uteri is effected through the agency of a factor common to both—namely, an associated inflammatory exudate in contact with epithelium. The basic cause of cervical cancer is to be found, according to the author, in this constant factor—that is, the action of contact inflammatory exudates of varying degree upon epithelia varying in type. In the case of squamous epithelium the malignant change is produced as the result of a re-irritation of massive degree affecting newly produced cells. In the case of columnar epithelium, a prolonged and intense irritation, probably recurrent, appears to be the deciding factor. In the case of the cervix uteri Bailey believes that the initial causal factor is bacterial and concerned to a large degree with the ordinary septic organisms. The bacterial or chemical irritant initiates a process of cell proliferation and repair which constitutes an intermediate causal factor in relation to the malignant process. The actual cell reaction appears to depend upon the density of the contact inflammatory exudate. Alteration in the density during the epithelial danger period results in an altered cell reaction, and it follows that involved epithelium at this stage must often just escape cancer through pathological means, resulting from coincident changes in inherent resistance.

REFERENCE.—*Surg. Gynecol. and Obst.* 1930, April, 688.

VACCINATION. (See also SMALL-POX.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—S. B. Woodward¹ illustrates the usual harmlessness of vaccination by the following figures. Of 8,500,000 persons in all vaccinated by the United States Army, Navy, and Public Health Service since 1917, only one has died, the cause of death being pleuropneumonia, which has never been regarded as a sequel of vaccination. In 1924, when Detroit had an epidemic of virulent small-pox, there were 817,000 vaccinations without a death or serious accident, although many people were vaccinated who would not have been under ordinary circumstances, such as mothers of newborn babies, and cases of tuberculosis, scarlet fever, diphtheria, measles, erysipelas, and venereal disease.

TECHNIQUE.—J. D. Rolleston² states that for the last seven years he has employed Goldberger's method of vaccinating on the inner and back side of the arm (see MEDICAL ANNUAL, 1922, p. 494), the advantages being that: (1) There is little or no exposure to infection from external sources; (2) The chances of trauma are minimized; and (3) No infiltration, sloughing, or extensive and obvious scarring results.

M. J. van Stockum³ maintains that, though vaccination is best performed within the first three months of life, it is contra-indicated in the first few weeks, and as a rule should not be carried out before the sixth week, when the child has adapted itself to the conditions of extra-uterine life. Owing to the fact that vaccination is always liable to cause some constitutional

disturbance, W. Kaupe⁴ recommends that it should not be performed in infants during the hot summer months except in urgent cases.

In view of the rapidity with which fresh vaccine lymph loses its efficacy in the tropics, Boyé,⁵ in French Equatorial Africa, for the last three or four years has been using dry lymph, which has proved successful in 95 per cent of the cases. Similarly successful results with dry lymph have been obtained in Germany as well as in the Belgian Congo and Togoland.

Numerous articles have recently been published on *intracutaneous vaccination* by German writers, such as F. Kirstein and G. Hunaeus,⁶ F. Kirstein,⁷ A. Groth,⁸ B. Bendix,⁹ and O. Kirsch.¹⁰ They seem to be generally agreed that intracutaneous vaccination is technically more difficult, takes longer to perform, and is more painful than the ordinary method. Moreover, it necessitates the use of a sterile lymph, which is not always available. Owing to the character of the trauma and the more elaborate procedure, the danger of secondary infection is greater than in cutaneous vaccination. The supposed advantage of the intracutaneous method of not leaving a scar renders it impossible to tell subsequently whether a person has been successfully vaccinated or not. Bendix,⁹ who carried out the method on twenty-two children, found that all had considerable constitutional disturbance between the eighth and eleventh day, when the temperature ranged between 102.2° and 104.4°.

According to Kirsch,¹⁰ the immunity conferred by intracutaneous vaccination disappears on the average earlier than that conferred by the ordinary method, so that when intracutaneous vaccination has been employed re-vaccination should be carried out earlier than usual. Kirsch attributes the longer duration of the immunity produced by cutaneous vaccination to the special affinity of the vaccine virus for the epidermis.

SYMPTOMS AND COMPLICATIONS.—Cases of *generalized vaccinia*, which is usually a very serious and fatal disease, are recorded by J. J. Zoon¹¹ in a woman, age 81, the subject of prurigo with eczematization, and A. Dickmann¹² in a child, age 3 years. Both recovered, the former as the result of injection of 50 c.c. of antivaccinal sheep serum, and the latter after injection of 6 c.c. of the mother's serum.

According to J. Nieuwenhuyse¹³ *post-vaccinal eruptions* usually appear from eight to twelve days after vaccination or revaccination, though they may occur sooner. They may be erythematous, maculopapular, vesicular, or very rarely pemphigoid. The eruption sometimes starts in the neighbourhood of the vaccination and extends therefrom on to the arms and trunk, while in others it begins on the face.

Post-vaccinal Encephalitis.—According to N. M. J. Jitta,¹⁴ 197 cases of post-vaccinal encephalitis have been reported in Holland, of which 138 were definite, while the others were more or less doubtful. The case mortality has varied, but has been as high as 33 per cent. Most of the cases which occurred in the first year of life were fatal, and there was only one death among the five cases which occurred in the second year. Hamel¹⁵ has collected 51 cases of post-vaccinal encephalitis which occurred in Germany in the years 1927-9 inclusive: 46 followed primary vaccination and 5 revaccination. The largest number occurred in May and June, which is the season when most vaccinations are performed, and in the first two years of life.

J. Zappert¹⁶ states that 28 cases of post-vaccinal encephalitis were notified in Vienna and Lower Austria during the year 1929. Most of the cases occurred in May and June, which were the chief months for vaccination, but a few appeared in the other months, including one in October; 5 died, and the others made a complete recovery. As about 175,800 vaccinations were

performed in Vienna and Lower Austria in 1929, the incidence of post-vaccinal encephalitis must be regarded as small.

According to C. Kling, N. Lönberg, and E. Wassen,¹⁷ among 422,827 vaccinations performed in Sweden in the period 1924-8 inclusive, 20 cases, of which 5 were fatal, had nervous sequelæ—an incidence of 4.7 per 100,000 vaccinated. P. Holst¹⁸ has collected 31 cases of post-vaccinal encephalitis which have occurred in Norway between 1921 and 1929 inclusive, the ages of the patients ranging from 2 to 25 years: 15 recovered, 15 died, and 1 became a chronic invalid. Carrière¹⁹ states that only five cases of post-vaccinal encephalitis with one death have been notified in Switzerland among about one and a half million vaccinations, and not a single case has occurred since 1926. The age of the patients ranged from 6 to 17 years. With the exception of one following revaccination all were cases of primary vaccination.

According to A. Syssine,²⁰ only two examples of the nervous sequelæ of vaccination have been reported in Soviet Russia, one being a case of encephalitis, and the other of poliomyelitis. As the result of their occurrence, practitioners in Soviet Russia have been instructed to notify all cases of nervous sequelæ of vaccination and to refrain from performing vaccination during outbreaks of lethargic encephalitis or other infectious diseases of the nervous system.

Yoannovitch²¹ states that not a single case of encephalitis occurred among 1,669,505 vaccinations performed in Jugo-Slavia between 1925 and 1928 inclusive, though a case of retrobulbar neuritis which developed in a child thirteen days after vaccination and ended in complete recovery was reported. The first and hitherto last case of post-vaccinal encephalitis in Jugo-Slavia was recorded in 1929 by Fodorovitch in a girl of 3 years who made a complete recovery. A. W. Grace²² reports a fatal case of post-vaccinal encephalitis in a girl of 15 which occurred in British Guiana, and is the first example of that complication to be reported from the tropics.

According to the official Reports presented to the Office internationale d'Hygiène publique,²³ no cases of post-vaccinal encephalitis were notified during 1928 in Italy, Roumania, or the Kingdom of the Serbs, Croats, and Slovenes, in spite of the large scale on which vaccinations have been carried out in these countries of recent years. J. Colombani²⁴ also reports that no cases of post-vaccinal encephalitis have been notified in Morocco, where vaccination has been carried out on an extensive scale, although he has made careful inquiries as to its occurrence during the last two years.

The commonest nervous sequel of vaccination is encephalitis, but examples of post-vaccinal neuritis (S. J. R. De Monchy²⁵), acute anterior poliomyelitis (S. T. Heidema²⁶), and myelitis (R. A. Perrett and R. C. Carrell,²⁷ H. G. Peake²⁸) have also been recorded.

As a means of preventing post-vaccinal encephalitis, S. P. Bedson²⁹ recommends that a lymph diluted 1-10 should be used for vaccinating infants or revaccination, one or two insertions being made by a crucial incision, or, as the Ministry of Health advises, one insertion with a single linear incision and undiluted lymph. Primary vaccination in anyone but an infant should only be performed when there is a risk of exposure to virulent small-pox. If a susceptible person must be vaccinated, the lymph must be diluted 1-50, and one insertion by a crucial incision should be used.

Cases have been recorded by Sir T. Horder,³⁰ J. Hekman,^{31 32} and H. M. Rozendaal³⁴ of the successful treatment of post-vaccinal encephalitis by intrathecal or intravenous injection of the **Serum** of the father or mother who had been vaccinated with the same lymph without any ill effects. Good results have also been reported by H. Aldershoff³⁵ from the use of the serum

of sheep immunized against vaccinia, which can be injected intrathecally, intravenously, intramuscularly, or subcutaneously. The serum is prepared at the Dutch Serum Institute at Utrecht and supplied free to practitioners on demand.

REFERENCES.—¹*New Eng. Jour. Med.* 1930, ccli, 319; ²*Postgraduate Med. Jour.* 1930, 165; ³*Nederl. Tijds. v. Geneesk.* 1930, 2215; ⁴*Med. Klin.* 1930, 163; ⁵*Bull. Off. internat. d'Hyg. publ.* 1929, 1528; ⁶*Med. Welt.* 1929, 1539; ⁷*Zeits. f. Hyg.* 1930, 31; ⁸*Munch. med. Woch.* 1930, 107; ⁹*Zeits. f. Kinderheilk.* 1929, xlviii, 694; ¹⁰*Ibid.* xlix, 1; ¹¹*Nederl. Tijds. v. Geneesk.* 1929, 5485; ¹²*Med. Welt.* 1929, 1366; ¹³*Nederl. Tijds. v. Geneesk.* 1929, 5999; ¹⁴*Bull. Off. internat. d'Hyg. publ.* 1930, 51; ¹⁵*Ibid.* 1929, 2052; ¹⁶*Wien. med. Woch.* 1930, 127; ¹⁷*Bull. Off. internat. d'Hyg. publ.* 1929, 2055; ¹⁸*Ibid.* 1930, 1132; ¹⁹*Ibid.* 1148; ²⁰*Ibid.* 1150; ²¹*Ibid.* 1153; ²²*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1930, 427; ²³*Bull. Off. internat. d'Hyg. publ.* 1929, 1133; ²⁴*Ibid.* 1523; ²⁵*Nederl. Tijds. v. Geneesk.* 1930, 755; ²⁶*Ibid.* 902; ²⁷*Jour. Amer. Med. Assoc.* 1930, xlv, 793; ²⁸*Jour. R.A.M.C.* 1929, 443; ²⁹*Lancet*, 1929, ii, 920; ³⁰*Ibid.* i, 1301; ³¹*Nederl. Tijds. v. Geneesk.* 1929, 4774; ³²*Med. Welt.* 1930, 247; ³³*Bull. Acad. Med.* 1930, ciii, 539; ³⁴*Nederl. Tijds. v. Geneesk.* 1929, 5117; ³⁵*Ibid.* 4962.

VAQUEZ-OSLER DISEASE. (See ERYTHREMIA.)

VARICELLA. (See CHICKEN-POX.)

VARICOSE ULCERS. (See ULCERS.)

VARICOSE VEINS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. A. Schmier¹ prefers to treat the veins for injection with the patient standing. Ordinarily no tourniquet is used. However, when the veins are very large a double tourniquet is applied with the patient standing. The patient is then allowed to lie down and the needle is inserted into the vein between the tourniquets. The leg is now elevated by an assistant and the proximal tourniquet is removed to allow the vein to empty by gravity. The tourniquet is then re-applied and the solution injected. In the treatment of varicose ulcers Schmier recommends the obliteration of every vein around the ulcer. Ulcers without associated superficial varicosities must, of course, be treated by other means.

Contra-indications to the Injection Treatment.—There are only two of importance—acute or subacute phlebitis, and cases with a disturbance of the deep veins. The writer tests the insufficiency of the deep veins by applying an elastic stocking. If the stocking is unbearable and produces numbness and marked pain in the leg, it is evident that the superficial system, even though varicose, is necessary for venous return. There is no danger in using the injection treatment in diabetic patients. Painful varicosities during the first period of pregnancy can be relieved by the injection method, but in these cases quinine must not be used, nor should it be used in patients who are menstruating. There is always the danger of inducing a hæmorrhage with grave results. In cases in which the solution accidentally enters the perivenous tissue, in order to prevent sloughing, 1 to 6 c.c. of **Distilled Water** should be injected to neutralize the caustic action of the chemical. In those cases treated within four days of the perivenous injection a slough was averted in every instance. The distilled water is injected into and around the discoloured tissue. Schmier prefers injections of **Chlorides**, but for general purposes the **Quinine and Urethane** solutions made up in ampoules will be found very satisfactory.

Ambulatory Ligation of Saphenous Vein.—Geza de Takats² recommends the ambulatory ligation of the saphenous vein. He points out that the Trendelenburg operation has fallen into disrepute except when combined with

more radical procedures, but the ligation of the saphenous vein high up, combined with injection treatment, is indicated in a certain number of cases. This method has the advantage of reducing the length of treatment. The injections into the collapsed veins below the ligature are more effective and obliterate longer segments. In some cases the ligation alone accomplishes a massive obliteration of the distal segment of the vein. The vein is ligated without any preliminary treatment except disinfection of the skin. The operation is performed in the standing position with full weight on the affected extremity. With local anaesthesia the vein is exposed high up where it is palpable. It is exposed by blunt dissection. Two ligatures are applied at such a distance to permit of a small segment of vein being removed for histologic study. A small pad of sterile gauze is pasted to the skin with surgical glue and a piece of strapping applied over this. The patient is then allowed to dress and go home. The author's paper is summarized thus: Ambulatory ligations of the saphenous vein are indicated in a small but well-defined group of cases in which the saphenous trunk above the knee is dilated and shows marked reflux from above. If the main reflux is from the deep communicating veins, the operation is obviously useless. The operation not only reduces venous pressure, but serves as a barrier to ascending thrombi caused by later injections. Furthermore, it greatly reduces the number of necessary injections below the ligation. In some cases the entire trunk below the ligature becomes thrombosed and no further injections are necessary. In the group of fifty patients so treated, no patient was immobilized for longer than twenty-four hours and many of them continued work. Apart from the economic advantage, the danger of embolism is minimized by the ambulatory procedure. In this series all patients were free from recurrence for more than a year if the operative indication was correct.

Technique of Injection Treatment.—T. O. Smith³ deals with this subject. The patient is treated lying down, and no tourniquet is applied. Before treatment, with the patient in the erect position, the points where injection is intended are marked. The proximal dilated extremity is usually chosen, and only one injection should be made at the first treatment. Ordinary fountain-pen ink has been found suitable for marking the sites for injection, and the patient is then made comfortable in the reclining position. Iodine is applied with a brush in order to avoid wiping off the ink markings. The needle is entered exactly through the centre of the mark and perpendicular to the surface of the skin. If the vein is entered, a little blood is aspirated into the syringe and then the injection is slowly carried out. If no flow is obtained, a second quick thrust is indicated. A small-bore needle only is required, no larger than that used for subcutaneous vaccines, but the bevel should be short. The most important requirement is that the needle be sharp. It should be discarded after two or three injections. **Quinine** solution is recommended without hesitation. Next to this, **Glucose** 50 per cent and **Sodium Chloride** 20 per cent may be considered. Smith recommends the injection treatment for *varicocele*. The varicosities are palpated with the patient standing, and the most prominent mass is held between the thumb and fingers of the left hand. The skin is infiltrated with local anaesthesia. The novocain syringe is detached and a syringe with quinine-urethane solution attached in its stead. Short quick stabs are made until the blood is aspirated, and then about 0.5 c.c. of solution is injected. Perivascular infiltration of the sclerosing solution has been found to be without effect in these cases. The patient should lie down for a few minutes after the needle is withdrawn in order to avoid hemorrhage into the scrotum. Collodion is applied, and a suspensory bandage is worn for several days after each injection. A number of injections may be required.

Weekly intervals are recommended, but a month must elapse before the result of treatment can be judged properly.

A similar treatment is particularly suitable for *hydrocele*. The fluid is first aspirated, and then with the needle *in situ* an injection of the sclerosing solution is made, the amount depending upon the size of the sac. **Quinine and Urea Hydrochloride**, 5 per cent, will be found suitable for this injection, or the old classical injection of a drop or two of pure **Carbolic Acid** may be essayed, if it is determined that the patient is not one of those individuals who are susceptible to the gangrene produced in some patients by this drug. If recurrence takes place, it is quite as easy to repeat the treatment, and usually it may be more accurately estimated. Treatment by this means has proved successful, also, to the delight of the patients in cases of recurrence following operation.

R. T. Payne⁴ thus describes his technique of injection. The quinine and urethane preparation is of the following formula: Quinine hydrochloride 4 grm., urethane 2 grm., aq. dest. ad 30 c.c. The active principle causing damage to the endothelial lining of the vein is the quinine, the urethane merely raising its solubility in aqueous solution. On standing, the solution slowly deposits crystals of quinine hydrochloride; these can easily be redissolved by warming to body temperature. The sodium salicylate solution is made up in strengths of 20 per cent, 30 per cent, and 40 per cent. The actual technique is similar for the two solutions.

The patient stands in a good light, and an Esmarch tourniquet or Martin's bandage is applied proximal to the proposed site of injection. The object of this is to render the veins prominent during the insertion of the needle, and in all cases it should be removed before the injection is made. The patient then lies down and the region of the proposed injection is carefully cleaned with ether. A 5-c.c. Record syringe carrying a No. 17 needle is filled with the required amount of solution and introduced obliquely through healthy skin into the lumen of the vein. The plunger is then slightly withdrawn to confirm the fact that the needle is in the lumen. At this point the tourniquet is removed, allowing the vein to collapse and ensuring that the quinine and urethane solution reaches the vein walls in a high concentration. As a rule, 1 c.c. in fifteen seconds is about the average rate of injection, but no force must be used and the time must depend to some extent on the resistance encountered. Pressure is then applied with an ether swab over the site of injection and the needle is withdrawn, the swab being kept in position for two minutes. The puncture is dressed with collodion on a pledget of wool, and when dry the whole is covered with a small square of wool and firmly bandaged. The maintenance of digital pressure after injection, the collodion dressing, and the bandaging are designed to lessen the risk of leakage of blood mixed with injection material into the subcutaneous tissues around the site of puncture. Leakage is almost certain to cause local complications. The patient goes home, and returns at the end of a week for further treatment. All the patient's usual activities are permitted, rest is not enjoined, but the normal reactions which follow injection are explained.

Considerable discussion has centred round the question of the position during the injection, many workers preferring to have the patient standing. This was done in some of the earlier cases, but abandoned because many of the patients objected. On theoretical grounds it might seem desirable to insist on rest for ten to fifteen minutes after the injection to prevent any possible aspiration of blood into the deeper veins, but this has not been carried out and no untoward effect has been noted.

The simplest way appears to be to introduce the needle into any portion of

the vein selected when the patient is standing, with a tourniquet applied, taking care that the tourniquet is only sufficiently tight to cause venous engorgement. With the needle *in situ* put the patient lying down, remove the tourniquet, and make sure that the needle is in position by aspirating a few drops of blood before injecting the solution.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, April 19, 1222; ²*Ibid.* 1194; ³*Canad. Med. Assoc. Jour.* 1930, May, 627; ⁴*Lancet*, 1929, ii, 313.

VARIOLA. (See SMALL-POX; VACCINATION.)

VEINS, VARICOSE. (See VARICOSE VEINS.)

VENOCLYSIS. (See PRE- AND POST-OPERATIVE TREATMENT.)

VISCERAL DECOMPRESSION. Sir W. I. de C. Wheeler, F.R.C.S.I.

The reviewer¹ points out that when an organ or system is suffering directly from pressure effects, or indirectly from back-pressure, the greater the pressure the more gradual should be its relief. This law has a wide application. Uremia follows the sudden release of back-pressure on the kidneys in cases of *prostatic enlargement*. *Hepatic shock* follows the release of back-pressure on the liver from obstruction of the portal vein or common duct, and too generous *tapping of the pleural or peritoneal cavities* for effusions may be followed by death, from various causes. The risks of *spinal puncture* with too rapid withdrawal of fluid when the pressure is high are well known. In cases of *high blood-pressure* the administration of chloroform or a spinal anæsthetic may be followed by a sudden and fatal fall. (Injections of **Ephedrine**, and frequently intravenously, prevent a sudden fall of blood-pressure.) In ophthalmic departments *glaucoma* is treated by very slow withdrawal of aqueous humour from the anterior chamber. If the pressure is suddenly released, vascular dilatation, intra-ocular hæmorrhage, and retinal detachments may follow. Obstetricians are concerned in the condition of *hydramnios*. If the formation of fluid is quick and the membranes burst, syncope may follow the rapid reduction of abdominal tension. When inducing labour, the obstetrician lays special stress on the necessity for preventing a sudden outpouring of the fluid, and for this purpose a small valvular aperture is provided. The same procedure applies to *imperforate hymen* leading to hæmatocolpos; the fluid is allowed to drain slowly away after puncture with a trocar and cannula. If it is not drained slowly, the patient may pass into a condition of extreme shock.

In cases of back-pressure on the kidneys from enlarged prostate or other obstructions, gradual decompression of the bladder is essential. It is traditional that sudden decompression, either by uncontrolled cystotomy or by primary prostatectomy, is followed by a considerable mortality. Rapid emptying of the distended bladder by any method may be followed by acute œdema and congestion of the urinary tract ending in complete loss of renal function. In cases of overdistension of the bladder, the path of safety is not the inserting of a catheter and the withdrawal of small amounts of urine every few hours, nor is it safe to empty the bladder completely and to refill it partly with boracic or other solutions. In both methods there is sudden relief of intravesical pressure. The method recommended for emptying a distended bladder is either that of Van Zwalenburg or to attach a reversed Murphy drip apparatus to an indwelling catheter.

Sudden relief of pressure by rapid emptying of the intestinal contents in *intestinal obstruction* causes collapse of the intestinal walls, flooding of the vascular channels, and a marked fall in blood-pressure, which produce a clinical

picture of general shock. A small tube which acts in the nature of a safety-valve and permits of gradual decompression gives better results. It is notorious that in cases of *acute empyema* the removal of a rib and the sudden emptying of the pleural cavity by means of a large drainage-tube is often followed by flapping mediastinum and death. Once again the decompression must be performed gradually by repeated aspirations before the major operation is undertaken. By the adoption of conservative methods the mortality of acute empyema has been reduced from about 40 to 5 per cent.

It is the experience of the reviewer that, whether the pressure is high or only moderately raised within the thorax, whether the infection is pneumococcal and associated with adhesions of the lung to the chest wall, or streptococcal and diffuse, the line of greatest safety is to aspirate or drain with a catheter before resorting to free evacuation of the pleural cavity. Closed drainage by a catheter introduced through a cannula when the trocar is withdrawn is a simple procedure. In a number of cases nothing more is required. It is advisable to have an X-ray to show the position of the catheter in the chest lest during dressings it moves in too far. Adhesive strapping applied to the chest wall with a small flap or tongue cut to stick on to the side of the catheter retains the latter in position.

(See also MEDICAL ANNUAL, 1922, p. 456; 1924, p. 153; 1925, p. 124; 1926, p. 85.)

REFERENCE.—*Brit. Med. Jour.* (Canad. Suppl.) 1930, Aug. 30.

VISCEROPTOSIS. (See also STOMACH, SURGICAL DISEASES OF.)

Robert Hutchison, M.D., F.R.C.P.

H. Beddingfield¹ has published a very elaborate study of visceroptosis and the condition of chronic invalidism often associated with it. His paper is so exhaustive (it contains more than 640 references to the literature!) that it is impossible to summarize it here, but it has now been published in book form (Oxford University Press), and anyone specially interested in the subject should study it for himself. His chief conclusions are as follows:—

1. The position of the viscera within the abdomen may vary to a considerable extent and yet be well within the range of normality.

2. There is no necessary relationship between the body build of the individual and the position of the abdominal viscera beyond that imposed by mechanical necessity. That is to say, *ceteris paribus*, the organs will be higher in a short broad abdomen than they will in a long narrow one.

3. There is a considerable range of movement of the hollow viscera which is normal for any given individual, so that their actual position in health may vary from time to time.

4. This variation in position may be brought about either by physiological factors or by psychical ones.

5. The position of the viscera, *per se*, plays no part in the production of symptoms. It only does so in rare cases when associated with a true abnormality, as for instance an aberrant renal artery.

6. While one or several of the symptoms discussed may appear as transient phenomena in any individual, their persistence is only met with in those of a special constitution.

7. This constitution is not associated with a special body build, but rather with a state of nutrition and state of mind.

8. This state of nutrition betrays itself in the tall thin individual by underweight, and in the short broad individual by overweight. In both it is accompanied by poor muscle tone leading to postural defects. The state of mind reveals itself by abnormal mental reactions.

9. The association of malnutrition, poor muscle tone, and abnormal mental reactivity is characteristic for this group of cases.

10. This association appears to depend on a congenital, possibly inherited inability of the individual to adapt himself satisfactorily to the various strains and stresses of life.

11. One of the failures of adaptation may be lack of resistance to degrees of infection and toxemia which have no effect on normal individuals. This may account for the failure to discover the 'toxin' present in cases of auto-intoxication.

12. When sensations from malfunctioning viscera rise into consciousness in an individual who is the subject of repressions based upon an inferiority complex, these tend to be utilized in the form of symptoms to reinforce the repression. The malfunction may originate peripherally from local causes as improper feeding, etc., or centrally from weakening of inhibition produced by fresh mental conflicts.

13. Later, with the establishment of a vicious circle of malfunction-symptoms-malfunction, actual tissue changes may occur in the affected organs, rendering them incapable of a return to normal function.

14. When this occurs there is little chance of restoring the individual to his or her particular standard of health.

15. The treatment of the condition is essentially preventive.

REFERENCE.—¹*Quart. Jour. Med.* 1929, July, 611.

WHOOPIING-COUGH.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—In a paper on the *influence of other infections upon whooping-cough*, M. Erlich¹ states that, as it has long been known that vaccination against small-pox can arrest the paroxysms, he has been in the habit for some years of vaccinating children, especially infants, suffering from whooping-cough during the first stage of the disease. Although in some instances the operation had no effect and in others merely attenuated the disease, in 5 out of 17 cases the disturbance produced by vaccination, consisting of fever, œdema, and the formation of pustules, seemed to cut short the disease when it was fully developed. The results were much less satisfactory in the case of revaccination, probably owing to the milder degree of vaccinal reaction. Erlich also relates the case of a boy, age 4 years, with concurrent whooping-cough and meningococcus meningitis, who stopped coughing a few days after the onset of meningitis, but had a recurrence of cough, though no longer of a paroxysmal character, when the meningitis subsided on the eighteenth day.

Whooping-cough and Tuberculosis.—Whooping-cough, like measles, is generally credited with activating a dormant tuberculous infection. It is therefore surprising that out of 99 cases of whooping-cough and 137 cases of measles in tuberculous children observed by F. R. Choffé,² only 1 and 2 respectively showed any activation of the tuberculous process after recovery from the acute infection.

Nervous Complications.—W. G. Sears³ adopts the following classification: (1) (a) Convulsions; (b) Spasm of the glottis. (2) Paralysis: (a) Cerebral type, motor or sensory; (b) Spinal type, spastic or flaccid. (3) Meningeal syndrome and meningo-encephalitis. (4) Peripheral neuritis. (5) Mental and other nervous changes, including hysteria, hypochondria, melancholia, epilepsy, and dementia. The prognosis of all the nervous complications of whooping-cough is grave. A large proportion of the cases with convulsions associated with bronchopneumonia are fatal. Spasm of the glottis is usually fatal. According to Sears the primary cause in all the types of nervous complications

in pertussis is a toxic one. Of three cases reported by him (which were seen by the reviewer) the first was a male infant, age 3 months, who developed right hemiplegia in the third week, and the other two were a girl, age 3, and a boy, age 5 years, with symptoms of meningo-encephalitis which developed within the first fortnight of the disease. All made a complete recovery.

REFERENCES.—¹*Arch. Méd. Enf.* 1929, 666; ²*Thèse de Paris*, 1929, No. 168; ³*Brit. Jour. Child. Dis.* 1929, 178.

WORD-DEAFNESS, CONGENITAL. (See AUDITORY IMPERCEPTION, CONGENITAL.)

WRY-NECK. (See TORTICOLLIS, SPASMODIC.)

XANTHOMA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

The causation of xanthoma tumours has never been satisfactorily settled. For the last twenty years, owing to the investigations of Pollitzer and Wile, it has been generally thought that the tumours were produced by the deposit of cholesterol esters in the tissues, either primarily or more probably secondarily to some local inflammation, owing to the presence of excess of cholesterol in the blood. U. J. Wile, H. C. Eckstein, and A. C. Curtis¹ have recently been further investigating this subject. They note that in xanthoma cases cholesterol is not always found in excess in the blood. They also find that, of the total lipid content of normal epithelium, cholesterol exists to the extent of 20 per cent, while in xanthomatous tumours it only exists to the extent of from 1.5 to 2 per cent. They therefore conclude that some other cause must operate for the development of the tumours than the previously accepted high blood-cholesterol. A disordered fat metabolism in which cholesterol undoubtedly plays a part as a constituent of the body lipids is apparently responsible. They also find that in diabetic and potential diabetic cases, the appearance and involution of the lesions follow a rise and fall in the circulating lipids, and further that the lesions can be made to involute and even to disappear by diets low in calories; they can be made to reappear and increase in number when calories are raised to the point above maintenance level. Further investigation is necessary to determine the causation of xanthomas in cases in which lipæmia as evidence of the disorder of fat metabolism is not demonstrable.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1929, Oct., 489.

X-RAY DIAGNOSIS. (See also COLON. MULTIPLE POLYPOSIS OF; DENTISTRY, RADIOGRAPHY IN; HEART, X-RAY APPEARANCES; LUNG AND MEDIASTINUM, TUMOURS OF.) *C. Thurstan Holland, F.R.C.S.*

A most important advance in the status of radiology in this country has been made by the University of London. Whilst in practically all countries, for many years, there have been professors of radiology attached to the teaching schools and to the universities, Great Britain has stood aloof, and the most that has been done has been the appointment of a few men to the posts of lectureships. Now London University has created a Chair of Radiology in connection with the Cancer Hospital, Fulham, and the first occupant of this chair is Professor J. M. Woodburn Morison, M.D., F.R.C.P. Edin. Considering the importance of radiology in almost every branch of medicine and surgery, and that a course of lectures is now compulsory before qualifying, it is to be hoped that other universities will follow the example of London.

Ventilation of the X-ray Room.—The importance of efficient ventilation is well known, and R. K. Newman¹ describes his methods of accurately measuring the nitrogen peroxide content of the atmosphere in the room containing

the mechanical rectifiers of the deep X-ray therapy plant in the Royal Prince Alfred Hospital, Sydney. In this room the only ventilation was two nine-inch pipes through the ceiling surmounted by cowls exteriorly. Some tables show how inefficient this ventilation was, and indicate the amount of nitrogen peroxide found in the room following various times of use of the apparatus. The original paper should be consulted for technical details.

THE BONES.

The Os Calcis.—J. W. Sever² reports three cases in which he found that the os calcis on each side was developing from two separate centres. Radiographically the appearances were: (1) either a deep cleft extending through the bone, or (2) a line simulating a fracture extending completely between the two ossifying portions. In each case the line divided the bone into an anterior third and a posterior two-thirds. All were infants, and in one case re-examined at the age of 3 years the line had disappeared, coalescence of the two centres having taken place. One patient died, and one os calcis was obtained and examined; a complete layer of cartilage separated the two ossifying centres. The author has been unable to find any reference in the literature to this condition. [I have seen one exactly similar case this year in a child of 10 months who also had a congenital deformity of the toes. It was bilateral. The point is that if there had been an injury, and only one foot was examined, it would be easy to mistake it for a fracture.—C. T. H.]

The Femur.—

The Lesser Trochanter.—P. W. Lapidus³ describes, with radiographs taken at the time of the injury and after cure, a case of separation of the epiphysis of the lesser femoral trochanter. These cases are rare in the literature of the subject, but probably much commoner than this would suggest. The injury almost invariably occurs in boys between 13 and 17 years of age, and can easily be recognized radiographically. The position which shows it best is with the thigh on its dorsum and the foot externally rotated. The other side should always be included for comparison.

The Greater Trochanter.—R. W. Lewis⁴ calls attention to the conditions which affect the greater trochanter of the femur, and which are demonstrable by radiography. There is a very interesting series of radiographs illustrating this paper, and they show eleven different types of disease, amongst which are various types of infection, various types of new growths, and bursitis. The history of each case is included.

Capitellum of Humerus.—A peculiar affection of the ossifying capitellum of the humerus is described by H. J. Panner,⁵ who has found three such cases and has watched them over a period of years. Following trauma in children of 10 years of age or less, the clinical symptoms being very slight, he has found atypical X-ray change limited to the capitellum; at first merely slight rarefaction areas with structural blurring, whilst later the osseous centre becomes diminished and broken up. The affection belongs to the same group of cases as Legg's disease, Osgood's disease, etc. The course of the disease is lengthy, and complete resumption of normality may take three years or more. A series of radiographs illustrates this communication.

Isolated Aseptic Necrosis in the Epiphysis of the First Metatarsal Bone.—Under this title A. Wagner⁶ reports a case which he believes to be the first one described of this condition occurring at this site. The child had the symptoms so often associated with similar trouble elsewhere—pain, slight tumefaction, redness of the skin, and tenderness of the joint. The radiographs show the alterations in the affected epiphysis. The author discusses the various causation theories.

Marble Bones.—A paper by A. H. Pirie⁷ is an addition to our knowledge of the disease known as 'marble bones' (Albers-Schönberg's disease). He describes four cases in one family—a mother in whom the disease was fully developed, and three children watched over a period of years which show the commencement of the disease and the manner in which it spreads. Additionally there is included a complete pathological report, illustrated by microphotographs, of the bone obtained post mortem from one of the children who died at the age of 15 years. Pirie suggests that 'marble' is the wrong term to apply and that the correct term should be 'chalky', as the bones are softer and not harder than is usual. He considers an infective is more probable than an endocrine cause.

Hæmangioma of Bone.—P. C. Bucy and C. S. Capp,⁸ in a comprehensive paper on primary hæmangioma of bone, state that the first radiograph showing this condition was published in 1917. They now present eight cases with radiographs in seven, and believe that they have established the position that in the majority of such cases it is possible to make a correct diagnosis from the X-ray examination alone. This paper is a long one and, in addition to the radiographs, is illustrated by photographs of specimens and microphotographs. A comparison of the radiographs shows very characteristic X-ray appearances. One case is of especial interest inasmuch as it was watched and radiographed over a period of years, and the illustrations show very beautifully the spread of the disease. A comprehensive bibliography is attached.

Rickets.—A comprehensive paper entitled "The Roentgen Diagnosis of Rickets" really deals with the whole subject of this disease, its symptoms and pathology, in addition to containing a detailed account of the X-ray appearances in various stages. The author, R. S. Bromer,⁹ divides the Roentgen changes in infantile rickets as shown in the long bones into two types. In the first of these there is no cupping of the diaphysal ends, in the second the characteristic appearance is present. He also points out that in a certain number of early cases there may be no X-ray changes present. This paper is an attempt to summarize and classify, in orderly sequence, the X-ray changes seen in rickets. There are numerous illustrations.

Osteomalacia and Rickets.—The connection between these two conditions is clearly shown in J. P. Maxwell's paper¹⁰ on osteomalacia and foetal rickets. The author believes that osteomalacia is the manifestation of rickets in an individual whose bones have reached maturity, and is connected with a shortage of vitamin D, and in the majority of cases an actual calcium starvation. This paper is restricted to the type of osteomalacia seen in pregnancy. The fetus does not escape, and illustrations of antenatal rickets show the typical radiographic signs in a new-born child.

Pseudo-fractures.—A rare condition of bones is described by L. A. Milkman¹¹ under the title of "Pseudo-fractures (Hunger Osteopathy, Late Rickets, Osteomalacia)". The chief abnormality in this case is that a small area of rarefaction appears in a bone and this gradually spreads across a long bone until the radiographic appearances are exactly like those of a crack fracture without the slightest displacement. In the case recorded these pseudo-fractures were multiple in the long bones and in the ribs. The author deals with all work already published on this and similar conditions, discusses very fully the differential diagnosis, but he cannot suggest any cause. The interest of the case is the series of good radiographs taken at intervals over a considerable time, showing the progress of the disease notwithstanding the treatment adopted.

Bone Changes in Gaucher's Disease.—B. R. Kirklin and H. W. Hefke¹²

review twelve cases from the literature and report one case of their own of this disease from the point of view of the bone changes shown by X rays. These bone changes appear late in the disease and are characteristic; the reproductions shown—those from the author's case—demonstrate very beautifully the X-ray appearances of some of the long bones.

Bone Lesions in Syphilis.—E. P. Pendergrass, R. L. Gilman, and K. B. Castleton,¹³ in describing a very unusual case of tardive heredosyphilis, discuss the whole subject of the bone lesions seen in hereditary syphilis, whether prenatal or delayed. This is a long paper; it includes historical information, incidence and involvement, a table of various reported cases, the pathology, classification, and so on, whilst eighty-eight references are quoted. The authors' case is narrated in great detail, and numerous radiographs are reproduced of the varying bone lesions both before and after treatment.

Bone Cysts.—R. I. Harris¹⁴ reports a case of sebaceous cyst of the terminal phalanx of a thumb. From the radiographs and history a cyst was diagnosed; pathologically it was an epidermoid cyst. The author has been unable to find a report of a similar case, and suggests that in this case at some distant period the man had had—although there was no history—a deep puncture wound of the thumb and as a result epithelial cells became implanted in the bone.

Harry Platt¹⁵ has collected seventeen cases of these bone cysts and, in a paper illustrated by radiographs and microphotographs, discusses, amongst other things, the radiographic appearances. He maintains that for practical purposes only two varieties have to be considered: (1) Chondroma (myxochondroma); and (2) Osteitis fibrosa. These cysts originate in the growing ends (metaphysis), and the favourite site is in the bones of the little finger. The differential diagnosis between the two standard lesions cannot be made radiographically.

Myelomatosis.—P. Jacoby¹⁶ publishes a short description of a case of myelomatosis in a child 8 years of age. This condition is extremely rare in children. Radiographs of the spine during life and after death are very striking.

Growths in Bones of Mummies.—R. A. Gardner and A. L. Urquhart¹⁷ report upon the examination of two cases of bone tumour dug up in Egypt. One, about 2000 years old, is that of an osteosarcoma of a femur. This diagnosis was suggested by the radiographs and comparing them with those of sarcoma of this kind in a living subject. In the other, a tumour of the mandible, the effects of which are shown on a radiograph, the diagnosis is more doubtful; the authors suggest a myeloid epulis, a dentigerous cyst, a simple cyst, or a fibroma. This jaw is probably about 5000 years old.

The Intervertebral Discs.—All radiologists and orthopaedic surgeons should read an article by J. Calvé and M. Galland¹⁸ entitled, "The Intervertebral Nucleus Pulposus: its Anatomy, its Physiology, its Pathology". Calcification of the nucleus is occasionally seen radiographically, but the authors go much further than this. As the result of some pathology, very slight changes in the vertebræ can be interpreted as being caused by different conditions of this nucleus. This paper is very well illustrated by drawings, diagrams, and radiographs, and a bibliography is attached. (*See also SPINE, INJURIES OF.*)

THE BRAIN.

Encephalography.—A very valuable paper by E. P. Pendergrass¹⁹ on the interpretation of encephalographic observations is profusely illustrated with excellent radiographs. The technique is fully described with minute detail, as it is essential for the purposes of comparison that every radiograph of the

different cases should be made in exactly the same way. Also the author insists on the necessity of stereoscopic radiography because—in the lateral views—of the shadows, etc., from one side of the brain being superimposed upon those of the other. The paper contains a portion of the report of the American Committee on Standardization of Encephalography. The many cases of different conditions described in the paper are illustrated by radiographs which make it quite easy to see all the points and the variations from the normal. It would appear that atrophy of parts of the brain together with arachnoiditis are of frequent occurrence in the class of cases examined. These include various types of hydrocephalus, aplasia, arachnoiditis, porencephaly, and tumours of the brain or mass lesions. A full bibliography completes this paper. The author considers that the procedure is quite safe, and that under the conditions outlined will reveal pathological processes which otherwise cannot be demonstrated. (*Plate LXII.*)

Intracranial Calcifications.—An interesting paper by J. D. Camp²⁰ deals with the subject of intracranial calcification and its X-ray significance. It is based on a series of 781 verified brain lesions at the Mayo Clinic in which some calcification was discovered by X rays in 7.6 per cent. The writer divides cases into two main groups, the physiologic and the pathologic, and the latter is subdivided into the neoplastic and non-neoplastic groups. The physiologic include such structures as the pineal gland, choroid plexus, falx cerebri, and Pacchionian bodies; the pathologic include tumours, hematomas, tubercle, aneurysm, areas of old meningial disease and of old encephalitis. Many illustrations show some of these conditions.

The Pineal Body.—C. G. Dyke²¹ made 3000 radiographs of the skull to ascertain the value of measuring the normal position of the pineal shadow, of establishing the frequency of calcification of the pineal gland, and the frequency of its displacement in cases of tumour of the brain. In the course of this investigation other conditions were found and their frequency noted—conditions such as calcification of the internal carotid arteries, the falx, and the choroid plexus. The importance of the displacement of the pineal shadow is that it may be an indirect sign of brain tumour.

THE THORAX.

Phthisis.—An article on phthisis in general practice, with special reference to the diagnosis of an early case by W. Burton Wood,²² stresses the importance of radiography in no uncertain manner. We can recommend every practitioner to read this paper carefully; it is written by a consulting physician and not by a radiologist, but it gives full and unqualified support to the views which for many years have been put forward by numbers of radiologists who have had experience in this kind of work. "We must recognize that chest radiology has proved that much of the former teaching was wrong." "The X-ray tube is a more searching and a far more accurate instrument than Laennec's tube." These are two from the many striking sentences used in this paper.

A paper entitled "The Pathology of Early Pulmonary Tuberculosis as revealed by X Rays", by P. Kerley,²³ is of interest. This contribution to our knowledge is the result of long-continued and painstaking work requiring very careful observation over a large series of cases. Its scope is to demonstrate radiologically the place of the primary focus of disease, and to see how this fits in with various theories already advanced. Most excellent radiographs are used for illustrations to the text. The author appears to lay great stress on two sites for the primary focus of the disease (in children): (1) Ghon's focus, developing most frequently in the right lower lobe and showing as a

PLATE LXII

ENCEPHALOGRAPHY

(R. E. ROBERTS AND P. H. WHITAKER)



Normal encephalogram, showing filling of ventricles and outlining of cortical markings.

PLATE LXV

CALCIFICATION OF PERICARDIUM—*continued*

DR. E. VILANDER

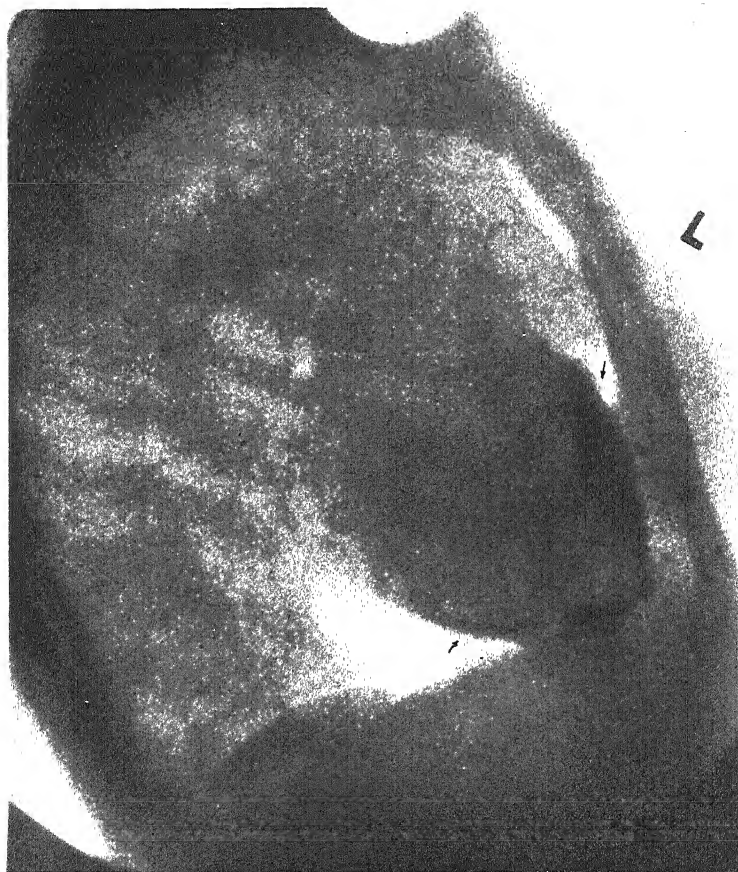


Fig. B.—Lateral view.

rounded shadow adjacent to the right diaphragm; and (2) Assmann's site, seen as a sharply defined round opacity in the right subclavicular region. He shows radiographs illustrative of both. (*See also* TUBERCULOSIS, PULMONARY.)

Massive Collapse of the Lung.—A paper on massive collapse of the lung by J. M. W. Morison²⁴ is one which should be read by every radiologist, although it is by no means limited to the radiological aspect alone. After defining the condition and giving the clinical signs, eight illustrative cases lead the author to his commentary. In the latter the different writers on this subject are quoted and their opinions criticized, and finally the author gives his own opinion of the cause of this condition and his reasons for adopting it. A bibliography is attached. [One of the most complete, and one of the best, essays upon this very interesting subject which has been written.—C. T. H.] (*See also* LUNG, MASSIVE COLLAPSE OF.)

Bronchial Obstruction.—P. N. Coryllos and G. L. Birnbaum²⁵ publish a long paper, the result of both experimental and clinical investigations. They claim that atelectasis, post-operative pneumonitis, and lobar pneumonia are all produced by the same mechanism; that they are all due to a factor of great importance—namely, bronchial obstruction—and that lobar pneumonia is a pneumococcic bronchial obstruction. This paper is illustrated by numerous radiographs, photographs, and microphotographs, and 177 references are attached. Experimental work on dogs is also described and illustrated.

Œdema of the Lungs.—H. F. Day, W. R. Sisson, and E. C. Vogt²⁶ report on a case of acute pulmonary œdema of anaphylactic shock in a boy of 14 who developed the condition following an accident and the administration of tetanus antitoxin. The first radiograph, taken just after the severe symptoms had subsided, shows a diffuse pulmonary congestion, but its true interpretation could not have been made without a complete knowledge of the case and radiographs on following days.

Bronchiectasis.—Hæmorrhagic dry bronchiectasis is an important condition inasmuch as it has to be distinguished from pulmonary tuberculosis. A. J. S. Pinchin and H. V. Morlock,²⁷ in a study of nine cases, which are detailed, conclude that in cases presenting the symptoms of hæmoptysis, where the physical signs are inconclusive and where radiographs show no definite evidence of pulmonary tuberculosis, an investigation by means of lipiodol injection of the bronchial tree should be made. Some radiographs illustrate this paper. (*See also* BRONCHIECTASIS.)

Round-shaped Opacities of the Thorax.—A classical paper appears on this subject by A. Belot and G. Peuteuil,²⁸ illustrated by some forty-eight fine and instructive radiographs. These demonstrate in no uncertain manner the difficulties to be met with in differential diagnosis by radiography alone; and the ease with which, at any rate in many cases, the correct diagnosis can be arrived at when the radiograph is considered along with the patient and the history. The authors divide their material into intrapulmonary, parietal, mediastinal, and diaphragmatic opacities.

Pneumoconiosis.—Those interested in 'the coal-miner's lung' will find the reports²⁹ upon the research work carried out by three selected teams of workers chosen from the Medical Staff of the Welsh National Memorial Association interesting and instructive. These reports deal in the main with the radiological appearances found in the lungs of groups of 'industrially healthy' coal-miners. The investigations showed quite clearly that long exposure to the dust of coal-mines, especially the dust of the anthracite coal-mines, leads to marked alterations in the lungs visible in radiographs, and that these are comparable, in many respects, with the alterations regarded as characteristic of silicosis. There is a considerable amount of statistical information embodied,

and a number of well-reproduced radiographs accompany the text. N. T. K. Jordan²¹ adds a carefully reported case, watched over a number of years, which went to post-mortem—a combination of tuberculosis, silicosis, and anthracosis. This paper also is well illustrated.

Mediastinitis.—K. Kornblum and D. A. Cooper³¹ call attention to the possibilities of making an X-ray diagnosis of tuberculous mediastinitis. They illustrate five cases, some of which went to post-mortem examination. This paper is of importance and interest inasmuch as, apparently for the first time, it establishes tuberculous mediastinitis as a clinically recognizable condition. The authors lay stress upon the point that tuberculous disease involving the mediastinum is always primarily a disease of the lymphatic system, and that until it has spread to the areolar and fibrous tissue, as well as the various structures of the mediastinum and the mediastinal pleura, it cannot be called a tuberculous mediastinitis. The characteristic X-ray appearance is a widening of the mediastinal shadow, not pathognomonic taken by itself alone.

J. Sagel and L. G. Rigler³² in an illustrated paper discuss the various types of mediastinal pleuritic effusion, and report their experience of 15 cases, 6 of which were empyemata and all posterior. The literature, not extensive, is reviewed. The characteristic X-ray appearances are described and discussed. The authors point out that this condition is not so rare as was formerly believed, and that it is often overlooked clinically. The characteristic X-ray shadow is triangular in shape, on either side of and continuous with the median shadow, from which latter it cannot be separated.

Localization of Lung Shadows.—C. R. Johnson³³ suggests an ingenious method for the X-ray localization of intrathoracic structures. The principle of this is that stereoscopic chest radiographs are taken, and the films are marked at the same time. The original paper should be referred to for the exact detail. The method does not appear to be at all complicated, and the author says it is very useful. During one year he applied it to 19 cases of lung abscess, and in 11 his findings were proved to be accurate either by surgery or by post-mortem. The method is by no means limited to this condition, however, and should be of use in many others, including the localization of foreign bodies within the thorax.

The Diaphragm.—A. E. Barclay,³⁴ in writing on the position and movements of the diaphragm, points out that posture makes no material difference either in the normal position or in the range of movement of the diaphragm. He also shows that the levels of the diaphragm as stated in various works on anatomy do not correspond with those found by radiography. This paper is full of interesting points and is illustrated with radiographs and drawings.

The Heart.—J. F. Brailsford's³⁵ case of *pneumopyopericardium* has given the author the opportunity of discussing the condition generally. He points out that the diagnosis of pneumopericardium can only be definitely established by an X-ray examination, but of course X rays will not differentiate between different kinds of fluid if this is present. A detailed history of this case and a full description of the rather remarkable X-ray appearances are given. (*Plate LXIII.*) (See also HEART AND PERICARDIUM, SURGERY OF.)

Calcification of the pericardium is rare. G. E. Vilvandré³⁶ publishes a very good example of this condition with excellent radiographical illustrations. In this paper the previous literature is referred to in detail, and it is pointed out that it is practically not diagnosable except by X-ray examination, that it is discovered accidentally, and could easily be missed by a screen examination only. Absence of symptoms is a characteristic of most of the cases of pericardial calcification, and the author's case was accidentally discovered during a routine chest examination which was being made before giving a barium meal.

(*Plates LXIV, LXV.*) [A further reference to this case is given in an article, *PERICARDIUM, CALCIFICATION OF*, by Dr. A. G. Gibson.]

The Mechanism of Swallowing.—A. E. Barclay³⁷ has carried out a series of experiments on swallowing, and has analysed these movements by X-ray examinations. His paper in which he describes his methods and his deductions from the observations made is of great interest. The writer has come to the conclusion that our ideas, and the text-book descriptions, of what actually occurs during the act of swallowing—that is, the passage of food from the mouth into the œsophagus and down the latter at any rate as far as the level of the clavicle—require a complete revision. From screen observations and from confirmatory films Barclay concludes that the food is shot into an open-mouthed œsophagus and is drawn down the first part of the latter by suction, and suction alone, and that the œsophagus in this part does not contract on the food and force it down by means of its own musculature. [If this is correct—and there is every reason to conclude that it is so—then this is another of the many instances in which examination by means of X rays has upset all previous teaching.—C. T. H.]

The Examination of the Upper Respiratory Tract.—A useful paper by H. K. Pancoast and E. P. Pendergrass³⁸ on the X-ray diagnosis of disease of the upper respiratory tract in children emphasizes the necessity for making an examination of the neck as a routine in every chest examination in a child. In order to get a satisfactory examination of this region in infants and young children a special technique, described by the authors, is necessary. Reproductions of radiographs show various changes in the soft parts which indicate a pathological condition. These include such things as retropharyngeal abscess, post-diphtheritic stenosis, pressure on the trachea from a large thymus, and so on. They consider that thymic death is due largely to obstructive tracheostenosis.

THE GASTRO-INTESTINAL TRACT.

The Emptying of the Stomach.—A. B. Moore,³⁹ in a paper entitled “An Appraisal of the Motor-test-meal in the Roentgen Examination of the Stomach and Small Bowel”, really discusses the diagnostic value of a six-hour delay in the emptying of the stomach. In his paper he endeavours to strike a balance sheet to show the assets and liabilities of this motor-test-meal, and concludes that the worth of the test seems scant. He also states that at the Mayo Clinic the motor-meal has been omitted of late in an extensive series of examinations, and apparently diagnostic errors have diminished rather than increased. [This paper and the discussion which follows it should be read; both are suggestive. Probably in the hands of very experienced and skilled radiologists the actual diagnostic value of a six-hour residue in the stomach is not very great, but on the other hand it is of great importance to most radiologists inasmuch as if a six-hour residue occurs it immediately becomes important, for the cause of this delay has to be found.—C. T. H.]

The Duodenal Niche.—“A Criterion in the Healing of Duodenal Ulcer” is the title of a paper by J. Buckstein,⁴⁰ in which he maintains that if the niche disappears at the same time as, under treatment, the symptoms entirely disappear, then it may be taken that the ulcer has healed. He illustrates the paper with radiographs of cases. Additionally an historical survey of the literature of the subject, as regards both gastric and duodenal ulcers, and the significance of the niche in the healing of these ulcers forms the bulk of this paper.

Diverticulitis.—A paper brings our knowledge of this condition up to date. E. I. Spriggs⁴¹ again discusses the disease under two headings, the

diverticular state running into the stage of formed diverticula which he calls 'diverticulosis'. The first is the stage which is practically symptomless and in which no active inflammation has occurred; and the second is the stage of active inflammation, true diverticulosis. The accurate diagnosis of at any rate the first of these is to all intents and purposes a purely radiological one. This paper, which is illustrated, contains a detailed account of the radiological features and also the technique for obtaining ocular proofs of the disease. An interesting feature is that the author has had opportunities of making an X-ray examination of many patients over a series of years, and so has seen radiographically the gradual changes which occur.

The Appendix.—With a basis of seven illustrative cases A. Orliansky⁴² discusses various points in diagnosis from the radiographic point of view. He considers that in 90 per cent of cases the appendix can be visualized by an opaque meal. Contrary to the attitude of most radiologists, he does not attach much importance to tenderness on screen palpation in the absence of other signs and symptoms; but he considers a dilated appendicular canal, and particularly the club-like dilatation of its distal end, as almost certain signs of disease. A satisfactory bibliography is attached, and the author's summary of the radiological possibilities and their diagnostic value is useful.

Technique of Examination.—In an interesting paper P. G. Boman⁴³ points out the great advantage of the use of a special method of compression in gastro-intestinal investigation. He calls attention to the fact that the work of Akerlund and Berg is not sufficiently well known, but that there is no doubt that it is an advance in making more accurate diagnoses. In this paper, which is illustrated, the technique is described and the advantages are summarized.

THE GALL-BLADDER.

The Use of Lipiodol.—W. H. Gabriel⁴⁴ has used lipiodol to prove the patency of the common bile-duct after two operations had been done on a gall-bladder. Radiographs show: (1) The T-shaped drainage-tube in position; (2) The lipiodol filling the common duct and passing into the duodenum; (3) The left and right hepatic ducts filled and lipiodol in the small bowel.

A very full paper on the subject of lipiodol studies of post-operative biliary fistulae by L. Ginzburg and E. W. Benjamin⁴⁵ deals with both technique and interpretation. Many points of interest are discussed. (*See also GALL-BLADDER, SURGERY OF.*)

THE URINARY TRACT.

X-ray Examination During Operation.—R. J. Willan,⁴⁶ in a paper on radiography during operation for renal calculus, considers that this method of examination is of great practical value and has come to stay. He does not advocate the screen examination of the exposed kidney, but has a film exposed in the operating theatre whilst the kidney is on the loin. The radiographic technique is explained: the film should be available in from three to five minutes after exposure. He narrates in detail four cases which are typical as showing the possibilities of this method, and the radiographs are reproduced. He points out especially that, the exact site of the stone being clearly shown, less operation damage to the kidney results, and that it prevents pieces of a stone or stones being left behind.

Uroselectan, given by venous injection for the purpose of making the urinary tract visible to X rays, was first used by M. Swick.⁴⁷ His paper describes the technique adopted, and the results obtained, and is illustrated by eight radiographs reproduced to show the great practical value of this new

PLATE LXVI

RADIOGRAPHY OF THE KIDNEYS

(J. H. MATHER)

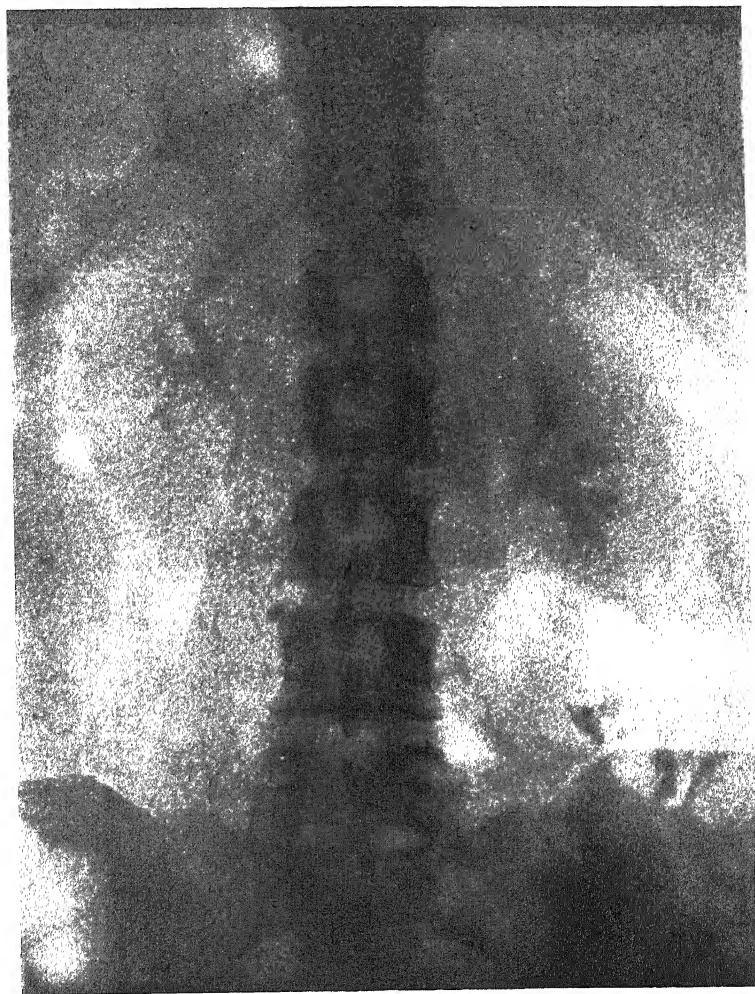


Fig. 1.—Normal kidneys and ureters after venous injection of uroselectan.

PLATE LXVII

RADIOGRAPHY OF THE KIDNEYS—*continued*

(R. E. ROBERTS)

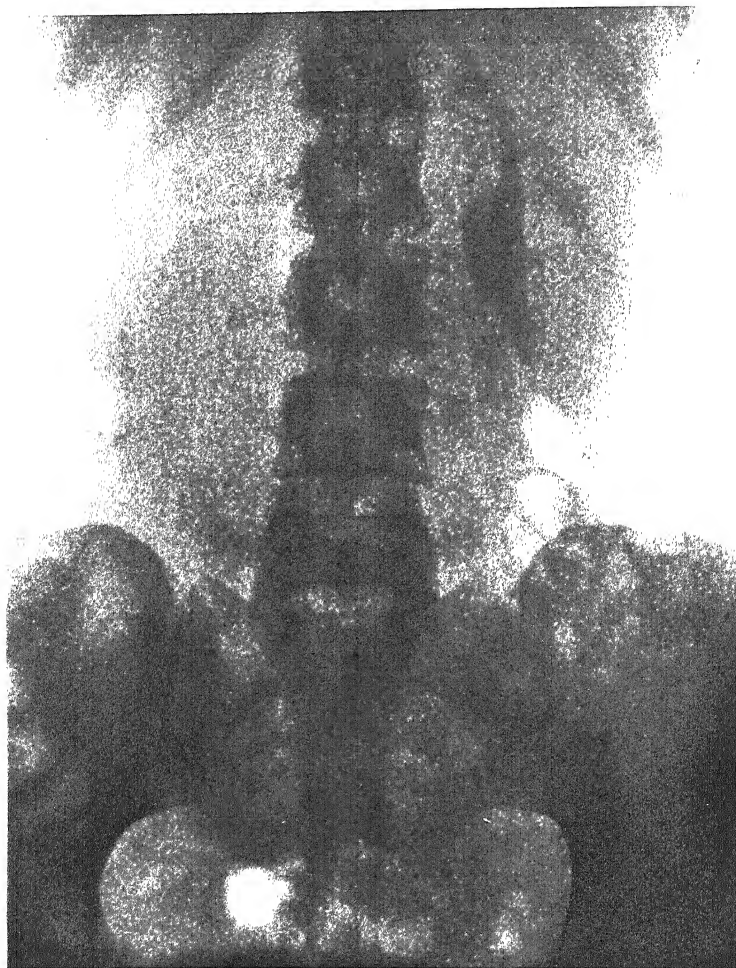


Fig. B.—Skilagram after venous injection of uroselectan, showing the right kidney functioning normally, and the left kidney not functioning but not showing the cause (*see Plate LXVIII*).

PLATE LXVIII

RADIOGRAPHY OF THE KIDNEYS—*continued*

(R. E. ROBERTS)

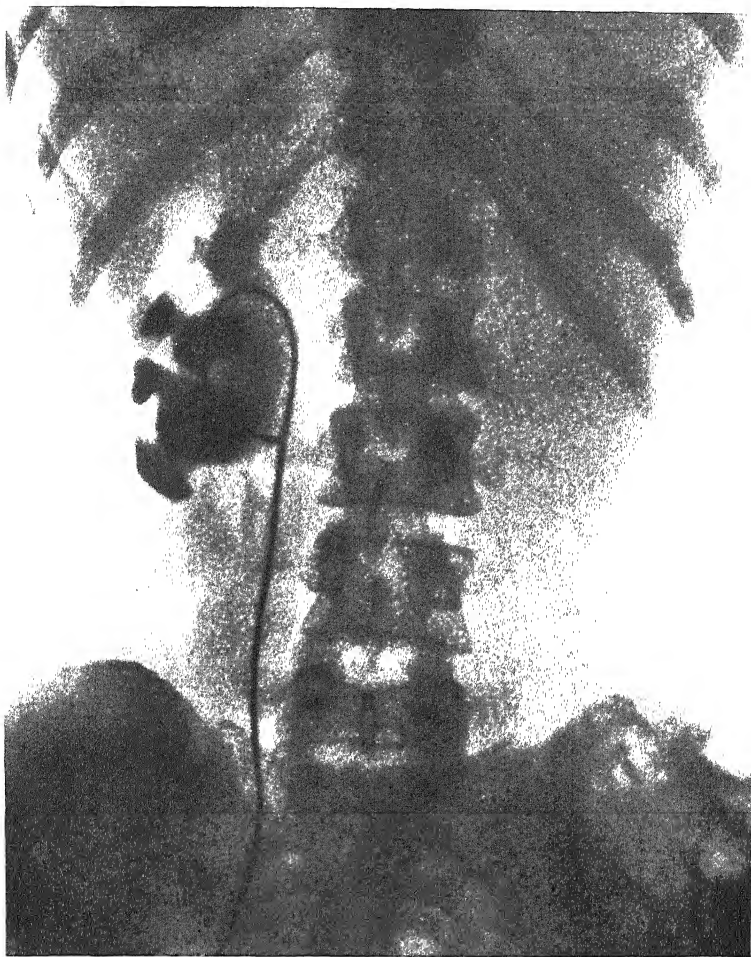


Fig. C.—A pyelogram of the left kidney in *Plate LXVII*, showing hydronephrosis.

method of urinary examination. (*Plates LXVI-LXVIII*.) [These radiographs illustrate very well some of the results to be obtained in the use of uroselectan. It should be noted that it is not possible in all cases to show the normal kidneys so well as in *Plate LXVI*; compare the shadow of the normal right kidney shown in *Plate LXVII* with these. Also, although *Plate LXVII* indicates an abnormality of the left kidney, no cause is demonstrated, and it remained for pyelography to show the hydronephrosis (*Plate LXVIII*).—C. T. H.] (*See also KIDNEY, SURGICAL AFFECTIONS OF.*)

An account of this latest method of kidney diagnosis will be found in a paper entitled "Excretion Urography", by K. Heritage and R. O. Ward.⁴⁸ The perfection of this method of examination is due to A. Roseno, who conceived the idea of combining intravenous administration of sodium iodide and urea with subsequent radiology of the urinary tract. Later on uroselectan was found to be more suitable and harmless even in large quantities. In this paper the authors describe the technique in detail, point out the indications and contra-indications, and illustrate and describe a few of their cases.

E. J. H. Roth and H. W. S. Wright⁴⁹ have used the method sixty times and record their results and technique. Cases are quoted in detail. Frank Kidd⁵⁰ contributes a paper of considerable interest in which, amongst other things, he deals with the toxicity of the drug, and discusses the indications for making this examination. This paper is full of useful information and raises many points of interest. He warns against the indiscriminate and routine use of this method of examination. He considers that the cases in which it is used should be carefully picked out; that whilst of great value, the X-ray findings are only part of the case from the point of view of interests of the patient and the question of treatment. He also was the first to publish a case in this country.⁵¹

Another paper on this subject which is very complete is by A. L. Wolbarst and I. S. Hirsch.⁵² They lay stress upon the negative finding; that is, where no uroselectan shows in a kidney, then either no kidney is present or the renal function has been practically destroyed. They describe their technique.

S. Lubash⁵³ deals with the method in a paper in which great stress is laid upon the importance of intermittent compression over the bladder area with an ordinary **Hickey Rubber Bag**. The reasons for this procedure are given.

Pyelography.—As a means of diagnosis of the presence of a horseshoe kidney, pyelography is discussed by A. Jacobs⁵⁴ in a paper which is based upon two cases of this abnormality in which there was a pathological condition as well: calculus was present in one case and hydronephrosis in the other. The radiographic illustrations are good and interesting.

L. Arntzen and B. Worning⁵⁵ publish the particulars of a very rare condition in which there was a double pelvis and double ureters to both kidneys. In addition to this congenital abnormality the lower kidney on the right side contained a large stone filling the pelvis and calices. Both kidney shadows were so long that a pyclographic examination was made. Striking radiographs illustrate the case.

Combined Pyelography and Cholecystography.—A finely illustrated paper by D. N. Eisendrath and R. A. Arens⁵⁶ stresses the advantages of pyelography and cholecystography as aids in the differentiation of shadows due to renal or biliary calculi, and the authors urge that in certain cases, which they enumerate, a combination of these two methods is necessary in order to make the certain diagnosis. [There is much that is of interest in this paper, but it leaves the impression that the authors overstate their case altogether. As a general rule a differential positive diagnosis can be made without the necessity of either a pyelogram or a cystogram, and the cases in which both are necessary

should be quite rare. They also state that 10 to 12 per cent of urinary calculi do not yield an X-ray shadow: this cannot be so unless stones in America differ considerably from those that are found in England. My own experience is that I have never had a surgeon remove a stone from either a kidney or a ureter the shadow of which had not been shown on the radiograph.—C. T. H.]

The Suprarenals.—T. Thompson⁵⁷ suggests that the suprarenal areas of all cases of suspected Addison's disease should be radiographically examined. Shadows in the gland will only show if there is some calcareous deposit present, but where this can be shown it is of positive diagnostic value. The radiograph in this case showed partially calcified bodies corresponding in shape and position to the suprarenal glands on each side of the first lumbar vertebra.

MISCELLANEOUS.

Foreign Bodies in the Scalp.—When X-raying the head of a man for a fracture of the skull, F. Knutsson⁵⁸ found a very curious condition. The whole calvarium was covered with some hundreds of minute shadows of metallic opacity which were a few millimetres in length and resembled fine threads. The man was quite bald, and it transpired that some years before he had had inserted some 2000 gold threads to each one of which a tuft of hair was attached. Six months later all the hairs had been worn away, leaving the gold roots *in situ*. [One meets with curious experiences in X-ray work and unusual shadows which are sometimes puzzling. *Plate LXXIX* shows what may occur when gluteal injections are made in a case of osteo-arthritis of the hip with a substance (lipiodol) which is opaque to X rays. Another form of such drug injection is seen in *Plate LXX*, where some bismuth salt had been injected.—C. T. H.]

Hysterosalpingography.—In a paper to which a bibliography of 214 references are attached, E. R. Witwer, H. P. Cushman, and T. Leucutia⁵⁹ discuss the present status of hysterosalpingography. They include an historical survey of the subject, review the literature, and report on 512 personal cases. The paper is well illustrated with forty-nine radiographs of normal and pathological conditions, and it should be valuable for reference. The authors conclude that the injection of lipiodol is a safe and simple procedure, and that it is of great diagnostic value in developmental anomalies, in tubal affections leading to sterility, in carefully selected cases of pregnancy, etc. They are very definitely of the opinion that its use in pregnancy should be confined to only carefully considered cases.

Nasal Sinuses.—D. L. Palmer's⁶⁰ paper on the X-ray examination of the accessory nasal sinuses discusses the relative values of the different positions of head and tube advocated by various workers and known by their names. The author lays particular stress upon the value of the Rhiese technique for the ethmoidal, and especially for the sphenoidal sinuses, and illustrations show the technique and the resulting radiographs. It is essential that the radiographs should be stereoscopic. The X-ray changes from the normal to be looked for are described. Those who have much of this kind of work to do will find this paper of use. (*See also* NASAL SINUSES, DISEASES OF.)

The Breast.—A profusely illustrated paper by S. L. Warren⁶¹ describes a simple method of studying the breast by means of stereoscopic radiographs. The simple technique is described, and the reproduction of radiographs shows the alteration from the normal to be seen in such conditions as breast abscess, chronic mastitis, benign and malignant tumours, etc. The author concludes that in this new field for radiology breast radiographs appear to warrant

PLATE LXIX
OSTEO-ARTHRITIS OF HIP



Fig. 1.—Skierman taken two years after gluteal injections of Ipyodol.

PLATE LXX

OSTEO-ARTHRITIS OF HIP—*continued*



Fig. B.—Skigram taken after injections of some bismuth salt into the tissues.

the impression that the type of examination is of distinct clinical value: he has studied 100 cases.

Calcified Worms.—An interesting paper entitled the "Roentgen Demonstration of Calcified *Filaria bancrofti*" is by F. W. O'Connor, R. Golden, and H. Auchincloss.⁶² It is well known, of course, that shadows of calcified and dead worms can be shown by X rays, but these authors carry the matter still further. Histologically it has been proved that dead, calcified, and living filariæ occur in the human tissues in juxtaposition. In a case of elephantiasis of a leg where areas were excised following the finding of calcified worms, living worms were found in the excised portions, and improvement in the condition followed on the operations. The case is given in full detail with radiographs, microphotographs, etc.

REFERENCES.—¹*Med. Jour. of Australia*, 1930, i, 581; ²*Surg. Gynecol. and Obst.* 1930, June, 1012; ³*Jour. Bone and Joint Surg.* 1930, July, 548; ⁴*Ibid.* Jan., 15; ⁵*Acta Radiol.* 1929, Aug., 234; ⁶*Ibid.* 1930, April, 80; ⁷*Amer. Jour. Roentgenol.* 1930, ii, 147; ⁸*Ibid.* i, 1; ⁹*Ibid.* 469; ¹⁰*Brit. Jour. Radiol.* 1930, Aug., 375; ¹¹*Amer. Jour. Roentgenol.* 1930, ii, 29; ¹²*Ibid.* 258; ¹³*Ibid.* 234; ¹⁴*Jour. Bone and Joint Surg.* 1930, July, 647; ¹⁵*Brit. Jour. Surg.* 1930, July, 20; ¹⁶*Acta Radiol.* 1930, 224; ¹⁷*Brit. Med. Jour.* 1930, ii, 211; ¹⁸*Jour. Bone and Joint Surg.* 1930, July, 555; ¹⁹*Arch. of Neurol. and Psychiat.* 1930, May, 946; ²⁰*Amer. Jour. Roentgenol.* 1930, i, 615; ²¹*Ibid.* 598; ²²*Lancet*, 1930, ii, 726; ²³*Brit. Jour. Radiol.* 1930, Sept., 404; ²⁴*Brit. Med. Jour.* 1930, ii, 237; ²⁵*Amer. Jour. Roentgenol.* 1929, ii, 401; ²⁶*Ibid.* 349; ²⁷*Brit. Med. Jour.* 1930, ii, 315; ²⁸*Jour. de Radiol. et d'Electrol.* 1930, Oct., 529; ²⁹*Report of Welsh Nat. Mem. Assoc.* 1930, 158; ³⁰*Ibid.* 156; ³¹*Amer. Jour. Roentgenol.* 1930, i, 276; ³²*Ibid.* ii, 225; ³³*Amer. Jour. Surg.* 1930, June, 1237; ³⁴*Brit. Jour. Radiol.* 1930, July, 295; ³⁵*Brit. Med. Jour.* 1929, ii, 1053; ³⁶*Lancet*, 1930, i, 564; ³⁷*Brit. Med. Jour.* 1930, i, 453; ³⁸*Amer. Jour. Roentgenol.* 1930, i, 241; ³⁹*Ibid.* 503; ⁴⁰*Surg. Gynecol. and Obst.* 1930, July, 109; ⁴¹*Brit. Med. Jour.* 1929, ii, 569; ⁴²*Ibid.* 1930, i, 330; ⁴³*Jour. Amer. Med. Assoc.* 1930, i, 464; ⁴⁴*Lancet*, 1930, i, 1014; ⁴⁵*Ann. of Surg.* 1930, Feb., 233; ⁴⁶*Brit. Med. Jour.* 1930, ii, 552; ⁴⁷*Klin. Woch.* 1929, Nov. 5, 2087; ⁴⁸*Amer. Jour. Roentgenol.* 1930, i, 686 (a full abstract); ⁴⁹*Brit. Med. Jour.* 1930, i, 734; ⁵⁰*Ibid.* 778; ⁵¹*Lancet*, 1930, ii, 128; ⁵²*Brit. Jour. Urol.* 1930, March, 47; ⁵³*Med. Jour. and Record*, 1930, July 2, 1; ⁵⁴*Brit. Med. Jour.* Ep. 1930, ii, 26; ⁵⁵*Amer. Jour. Surg.* 1930, June, 1229; ⁵⁶*Brit. Med. Jour.* Ep. 1930, ii, 26; ⁵⁷*Brit. Med. Jour.* 1930, ii, 8; ⁵⁸*Acta Radiol.* 1929, Nov., 499; ⁵⁹*Surg. Gynecol. and Obst.* 1929, xlix, 1; ⁶⁰*Lancet*, 1930, ii, 785; ⁶¹*Acta Radiol.* 1930, April, 78; ⁶²*Amer. Jour. Roentgenol.* 1930, i, 125; ⁶³*Amer. Jour. Surg.* 1930, April, 657; ⁶⁴*Amer. Jour. Roentgenol.* 1930, ii, 113; ⁶⁵*Ibid.* 494.

X-RAY THERAPY. (See also PITUITARY TUMOURS.)

C. Thurstan Holland, F.R.C.S.

Pruritus Ani et Vulvæ.—In a practical and useful paper, L. F. R. Knuthsen and F. H. Humphris¹ discuss the treatment of this very troublesome condition, and stress the important results to be got both by ultra-violet rays and by X rays. A full account of the authors' technique by either method is given. They consider that X-ray treatment is of the utmost value in pruritus, especially in cases of long standing. They suggest that non-success is largely due to want of knowledge as to the manner in which X-ray treatment is carried out, and that there are no dangers at all if skilfully applied. [We can corroborate all that is said in this paper on the usefulness of X-ray treatment, and we consider that it is the method of choice. Nearly all the patients referred to the radiologist are long-standing cases in which nearly every other method of treatment has already been tried. Sometimes, though rarely, X-ray treatment also fails, but it almost always gives some relief. Often results are dramatic. I know of two desperately bad cases—in one of which an eczematous condition, adding to the horrors, had spread from the anal region to the whole of the scrotum, penis, both groins, and lower abdomen—in which one exposure to X rays produced such a good effect that neither patient wished to have the second dose which was insisted upon. The condition disappeared in both cases almost at once and has never reappeared. There is no danger of any kind in competent hands.—C. T. H.]

Polycythæmia.—G. Milani² has treated cases of this condition, known as Vaquez's disease, by means of X rays with success. He considers that X-ray therapy applied skilfully represents the most efficacious and most certain means for cure. It is useless to irradiate either the spleen or the flat bones, but when the X rays are directed on the long bones the number of red corpuscles decreases to normal, the spleen reduces in size, and cure results. How long the patient will remain cured it is not at present possible to say, but one patient has remained normal for three years since the last treatment. (See also ERYTHRÆMIA.)

Xanthomatosis.—M. C. Sosman³ has treated three cases of this condition (Schüller's disease) by means of X rays. All these cases showed, radiographically, definite destructive bone lesions affecting the skull which were spreading. These did not show any reparative changes on diet, but the skull defects underwent healing changes in each case as a result of exposure to X rays. This paper is well illustrated, and the literature of the subject is reviewed.

Tumours.—A. U. Desjardins,⁴ in a paper entitled "The Reaction to Irradiation as a Means of Differentiating Certain Varieties of Tumour", stresses the fact that in addition to being of value therapeutically, the response of tumours of various kinds and in various places to irradiation is not infrequently a diagnostic point of great importance. Cases are quoted to substantiate this contention, and the paper is illustrated by photographs and radiographs. In addition to the glandular tumours, the effect of irradiation on tumours of the testis and the tumours of bone often helps to clear up a doubtful diagnosis. A large bibliography is attached.

REFERENCES.—¹*Lancet*. 1930, ii, 569; ²*Jour. Amer. Med. Assoc.* 1929, ii, 1205; ³*Amer. Jour. Roentgenol.* 1930, June, 581; ⁴*Brit. Jour. Radiol.* 1930, 6.

YAWS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Experimental work on yaws infection in rabbits, which was carried out over a number of years by United States army surgeons, is summarized by M. A. Reasoner,¹ who took over the work from Nichols in 1916 and continued it until the United States came into the Great War in the following year. The infection was carried on for fifty generations, and the main conclusion arrived at was that the presence of a yaws testicular lesion of some duration protects against inoculation of the opposite organ with syphilis, but not against intravenous injection. Further, intravenous injections of syphilis protect against intratesticular inoculations of both diseases. There is therefore a certain amount of cross-immunity. S. M. Lambert² reports on yaws in the Pacific, and he agrees that syphilis is almost unknown among the yaws-infected South Pacific races, so this area presents ideal conditions for studying the protean manifestations of yaws, which in many of the later symptoms closely resemble those of syphilis. Signs of yaws were found in 50 to 70 per cent of the people in the island of Rotamah with 2400 people, and an inquiry showed that almost 50 per cent of the youth up to 13 years of age gave a history of yaws without actual symptoms, so it is among these that the later manifestations are likely to develop. Mass treatment of those with symptoms failed to eradicate the disease, so mass treatment of all youths up to the age of 17, and symptomatic treatment of others, are advised. R. Leon³ deals with hereditary yaws on the basis of 225 deliveries in which the mothers were systematically searched for syphilis or yaws, and its possible transmission to the children, together with a Kahn reaction of the mother and baby, and the presence of hypertrophy of the placenta and of abortions and still-born children. He concludes that hereditary transmission is possible in yaws, but foetal mortality is five

times greater in syphilis than in yaws. J. O. Shirecore⁴ has investigated the epidemiology of yaws in Tanganyika Territory, and he points out that the higher incidence of the disease in the low-lying coastal area is associated with poor soil, and deficiency of animal proteins, calcium, and milk in the diet; these also predispose to severe attacks with late bone manifestations. B. C. Mukharji⁵ reports the presence of yaws in the Chittagong Hill tracts of Bengal, with greater prevalence during the rainy season. The disease appears to have been imported from Burma, and **Neosalvarsan** effected a speedy cure.

REFERENCES.—¹*Amer. Jour. Trop. Dis.* 1929, Nov., 413; ²*Ibid.* 429; ³*Ibid.* 493; ⁴*Lancet*, 1930, i, 960; ⁵*Ind. Med. Gaz.* 1930, Jan., 10.

YELLOW FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

C. B. Philip and others¹ report further experiments on the transmission of yellow fever by mosquitoes other than *Aedes*. These proved that the common West African domestic mosquito, *Taeniorhynchus africanus*, is capable of transmitting the yellow fever virus, and the shortest positive transmission took place sixteen days after biting a monkey. *Anopheles gambiae* was also tested with negative results. R. C. Shannon, A. W. Burke, and N. C. Davis² report important experiments to determine how a batch of *Stegomyia aegypti*, marked with methylene blue or eosin (gentian violet appeared to be toxic to the insects) by means of a spray, could be detected in a three-story house in which they had been set free, or in neighbouring houses, in the course of which 3500 mosquitoes were used. From the marked mosquitoes subsequently caught it was found that dispersion to other houses began within twenty-four hours; at the end of a week 90 per cent, and after two weeks 99 per cent, had disappeared from the house of release, and in one trial 3·12 per cent were found in an adjoining house within five days of release. R. C. Shannon and N. C. Davis³ also report elaborate experiments on similar lines to determine the length of flight of the *Stegomyia aegypti*, during which over 20,000 stained specimens were released in small villages, with the result that two were recovered 300 metres away and 95 were recaptured at intermediate points. Another lot of 12,000 insects were released on a boat 300 metres from one shore and 900 from the opposite shore, and eight were recovered on land approximately one kilometre from the boat, and one was caught thirteen days after release. These observations are of practical importance in view of the fact that the 1909 International Sanitary Convention of American Republics ordered that yellow-fever-infected ships should be moored at least 200 metres from the inhabited shore, which now appears to be unsafe.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1930, Jan., 1; ²*Ibid.* 1930, March, 145; ³*Ibid.* 151.

II

THE PRACTITIONERS' INDEX.

NEW PHARMACEUTICAL PREPARATIONS, AND SURGICAL APPLIANCES, ETC.

In this Section we give short descriptions of the Pharmaceutical Products and the New Inventions of the past Year. Every care is taken to notice only articles that seem worthy of our readers' attention. It should be understood that the information is supplied by the Makers, and can appear but once in this section.

We invite all concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference.

A short typewritten description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. Illustrations of Instruments may be inserted if small, and further information may be included in the advertisement section, to which page reference can be given if desired.

In the section on Drugs, their composition, principal applications, and doses should be stated.

PROGRESS OF PHARMACY, DIETETICS, ETC.

Acetylcholine.—An acetyl derivative of choline, indicated in conditions associated with arterial hypertension. Raynaud's disease, etc. Administered by subcutaneous or intramuscular injection. (May & Baker Ltd., Battersea, S.W.11.)

Adrephine Rx. 'B'.—Adrephine is a combination of adrenalin and ephedrine suitable for use in asthma, hay fever, etc. As a solution for topical application it has given highly satisfactory results. A slightly modified solution is now offered in 'Glaseptic' ampoules for hypodermic use. It contains adrenalin 1 in 2500 and ephedrine hydrochloride 3 per cent with 0.5 per cent of chlorotone. In doses of 0.5 c.c. to 1.0 c.c. (8 to 16 min.) it is used in asthma and urticaria, as it combines the rapid effect of adrenalin with the slower but more prolonged effect of ephedrine. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

"Azoule" Solution A.B.A.—A non-toxic local anæsthetic for the treatment of pruritus ani, pruritus vulvæ, and similar conditions of the skin and underlying tissues. The solvent is sterile oil, which ensures slow but uniform absorption, resulting in a prolonged local anæsthesia lasting for as long as ten days. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Bacte-pyo-chir.—This is a preparation of selected strains of the therapeutic bacteriophages of Professor d'Herelle (staphylococcus, streptococcus, proteus, pyocyaneus, etc.), capable of destroying various bacterial species occurring in suppurative processes, supplied in ampoules of 50 c.c. for use in major surgery: (1) In surface infections following surgical incision, by means of moistened compresses, or instillations introduced into the wound; (2) During operations, by frequent affusions to the entire wounded surface, by swabbing the peritoneal surfaces, sutures, and ligated muscular stumps. Supplied in boxes of 4 ampoules. (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1.)

Bile Salt Compound Tablets consist of active pancreatic extract, bile acids, duodenal mucous membrane extract with ipecacuanha and emodin. They are indicated in constipation, intestinal toxæmias, hepatic deficiency, gall-stones, and allied conditions. (Allen & Hanburys Ltd.)

Biocholine is chemically pure choline hydrochloride prepared according to the investigations of Professor Carles and Dr. Leuret. The treatment of all forms of tuberculosis with biocholine is based on the recognition that the condition of resistance to tuberculous infection is governed by the equilibrium of the relation glycæmia-cholesteræmia. Under biocholine treatment the proportion of blood-cholesterin is raised, the

blood-sugar-cholesterol ratio returns to normal, temperature is lowered, appetite improves, followed by a gain in weight and a subjective sense of euphoria. The authors employ 1 ampoule by subcutaneous injection every two days. Supplied in ampoules of 1 c.c. containing 2 cgrm. choline hydrochloride, in boxes of 10, 25, 50, and 100 ampoules. (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1.)

'Byno' Hepol.—A solution of liver extract in 'Bynin' liquid malt which enables mammalian liver to be given in a concentrated and palatable form. Three table-spoonfuls are equivalent to 8 oz. of fresh liver. (Allen & Hanburys Ltd.)

Calcium Chloride Solution.—For intravenous injection this is available in 'Glaseptic' ampoules of 10 c.c. (170 min.), containing a 10 per cent solution of the hydrated salt $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$. This solution given by intravenous injection (*never* subcutaneously or intramuscularly) is used in the treatment of paralysis agitans, tetany, epilepsy, or chorea; also to promote calcification in tuberculosis; or to supply deficient calcium in hæmorrhages resulting from slow coagulation of the blood, etc. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

Capsules Segry contain an association of antiseptics, cicatrizants of pulmonary tissue, and soothing medicaments which together form an efficacious compound for the treatment of bronchitis, coughs, catarrh, asthma, emphysema, influenza, and other respiratory affections. The antiseptic and antipyretic ingredients are guaiacol, creosote carbonate, iodoform, and eucalyptol, all of which have their particular value, and in combination an added synergic action. The sedatives are terpene, codeine, and belladonna. These medicaments incorporated in an olive-oil base are presented in gluten-coated capsules which ensure accurate dosage. Supplied in boxes of 50 capsules. (The Anglo-French Drug Co. Ltd.)

Citralka is a palatable effervescent combination of alkalinizing salts, so proportioned as to maintain physiological alkalinity of the blood. It corrects both gastric and systemic acidosis and protects against dehydration. It is supplied in discs each containing about 60 gr. of the citrates and tartrates of sodium and potassium, together with salts of calcium, magnesium, and lithium. In tubes of 25 discs. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

Colloidal Copper.—Recent investigations have demonstrated the increased restorative action of iron when reinforced with various metals, particularly copper, in the treatment of anemia. Beard and Meyers demonstrated that the latter metal is by far the most important, and that $\frac{1}{100000}$ mgrm. is sufficient to produce a definite effect. McHargue supports this contention, and other observers have stressed the probable importance of this development. The Crookes Laboratories are issuing a series of the well-known Collosol Ferrum products with special copper content. The preparations consist of: Collosol Ferrum and Cuprum; Collosol Ferro-Arsenic and Cuprum; Collosol Ferro-Manganese and Cuprum; and Collosol Manganese and Cuprum. The copper content is 1 in 20,000, and any of these preparations may be used both for injection and orally. (The Crookes Laboratories, 22, Chenies Street, W.C.1.)

Costan.—A preparation of tin and tin oxide, for oral administration in the treatment of furunculosis. (May & Baker Ltd., Battersea, S.W.11.)

Digitalis Leaf 'A & H' Tablets.—Each tablet contains 0.033 grm. ($\frac{1}{3}$ gr.) International standard digitalis leaf equivalent to $\frac{1}{3}$ International unit. The recognized daily dose is $\frac{1}{3}$ to 1 International unit per day, i.e., one to three tablets. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Elixir Sodium Sulphocyanate (P., D. & Co.) contains 20 gr. (1.3 grm.) of sodium sulphocyanate in each fluid ounce (28.5 c.c.). Indicated for the treatment of essential hypertension. The fall in blood-pressure produced by sodium sulphocyanate is reported to be more prolonged than that following other drugs. The dose should be gradually reduced. Supplied in bottles of 4 and 16 fluid ounces. (Parke, Davis & Co.)

Elixir Theophylline Compound (P., D. & Co.) is an effective combination of diuretic and urinary antiseptic ingredients designed for use in the treatment of dropsy and oedema due to renal insufficiency, and for use in fevers, nephritis, and pyelitis. Theophylline is the most active of the xanthine diuretics, and is free from the stimulating effect of caffeine on the nervous system. In this elixir it is associated with uritone (hexamine)—a potent urinary antiseptic—and fluid extract of couch-grass, which has long been used as a diuretic and demulcent. Supplied in bottles of 4 and 16 fluid ounces. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

Emge (Lumière).—Magnesium hyposulphite in ampoules and tablets for administration by injection as an anti-anaphylactic, and orally for stimulation and regularization of the digestive functions. The anti-anaphylactic properties of magnesium hyposulphite

have, from a therapeutic point of view, a very particular interest in a large number of pathological conditions—disorders of the neuromuscular and digestive systems, infections of the biliary tract, nervous debility, etc., in various manifestations of allergic symptoms, asthma, hay fever, urticaria, migraine, etc. Emge exerts a prophylactic and curative action, and on account of its anti-cancerous action is a valuable accessory treatment after radium in cancer. Supplied in boxes of 3×10 c.c. ampoules and boxes of 40 tablets. (The Anglo-French Drug Co. Ltd.)

Emplets, Thyroid-Ovarian.—The Emplet series of gland preparations are rapidly growing in favour, and a combination of thyroid gland (desiccated) $\frac{1}{2}$ gr. (0.016 grm.) with ovarian substance (desiccated) 5 gr. (0.325 grm.) has recently been added. The distinctive feature of Emplets is the special acid-resisting coating which protects the gland substance from possible destruction by the acid gastric juice. (Parke, Davis & Co.)

Ephedrine.—‘*Nebulique*’ Ephedrine contains 1 per cent of ephedrine in petrolatine, with menthol, camphor, etc., and is recommended for local application to the nose and pharynx in hay fever, asthma, and nasal sinusitis, etc., by means of an atomizer. (C. J. Hewlett & Son Ltd., Charlotte Street, E.C.2.)

‘*Nasalique*’ Ephedrine is a nasal application containing ephedrine (1 gr. to the oz.) with menthol, chlorbutol, etc., and is supplied in collapsible tubes with nozzles for insertion well into the nostrils. (C. J. Hewlett & Son Ltd.)

Epinalin.—This is a solution of ‘Wellcome’ brand adrenalin and ‘Wellcome’ brand ephedrine sulphate. It has been recently introduced for application to the pharynx and nose by means of an atomizer. Each c.c. contains adrenalin 0.0001 grm. (= 1 in 10,000) and ephedrine sulphate 0.02 grm. (= 1 in 50). In Epinalin the powerful but relatively transient action of adrenalin is followed by the prolonged action of the ephedrine.

Epinalin has been found valuable as a nasal spray in asthma and hay fever; in engorged and catarrhal conditions of the nose; to shrink the nasal mucosa, in order to aid drainage in sinus suppuration; and preparatory to rhinoscopy. Epinalin may also be applied on gauze or a swab to the turbinates, or to small accessible bleeding points, such as tooth sockets, or after tonsillectomy. It is issued by Burroughs Wellcome & Co., Snow Hill Buildings, E.C.1, in bottles of 10 c.c. and 25 c.c.

Eugastrol ‘A & H’.—Presents entire gastric tissue defatted and desiccated, 15 grm. being equivalent to 100 grm. fresh stomach tissue. Daily dose 10 grm. ‘*Byno*’ Eugastrol is a combination of ‘Bynin’ liquid malt with an active extract of gastric tissue. ‘*Kapsol*’ Eugastrol presents the active extract of gastric tissue in soluble gelatine capsules. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Glucose for Intravenous Administration.—A 50 per cent solution of pure crystallized dextrose, which has been shown by thorough and exacting tests to be of exceptional purity, is supplied in ‘Glaseptic’ ampoules of 20 c.c. and 50 c.c. The solution contains a buffer salt, which has been added to maintain the proper hydrogen-ion concentration and prevent excessive reaction. Glucose solution is indicated for intravenous administration in cases in which there is a pronounced disturbance of metabolism due to deficiency of carbohydrates, as frequently occurs in toxæmias of pregnancy, excessive muscular movement (as in chorea and eclampsia), post-operative shock, acidosis, etc. (Parke, Davis & Co., 50–54, Beak Street, W.1.)

Hydiol.—This iodized oil has been introduced as an opaque medium for use in bronchography, myelography, pyelography, etc. (May & Baker Ltd., Battersea, S.W.11.)

Intravenous Transfusion Solutions and Apparatus.—The Crookes Laboratories have prepared a series of solutions suitable for intravenous transfusions, each put up in a special glass container and ready for use in emergency. The containers, as will be seen from the illustration (Fig. 54), are ampoule-shaped, and have at one end an air inlet to which an air filter can be fitted by means of a short rubber tube, and at the other an outlet tube, which, when the apparatus is required for use, is connected to a cannula.

The standard aseptic solutions at present available are gum saline, hypertonic saline, normal saline solution, and normal glucose.

The transfusion ampoule is supported in a metallic holder, so designed that it can be suspended over the patient's bed or near the operating table. A small pamphlet giving full particulars may be obtained on application to Crookes Laboratories, 22, Chenies Street, W.C.1.

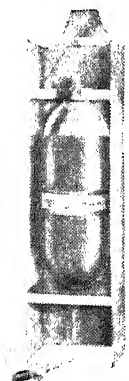


Fig. 54.

'Neo-Infundin.'—This new product for obstetrical use is the oxytocic principle of pituitary posterior lobe almost free from the pressor principle. It has the same indications in labour as pituitary posterior lobe extract, but the absence of the pressor principle precludes the occurrence of the vasomotor phenomenon known as 'pituitary shock' and also makes it desirable in those obstetrical cases with raised blood-pressure (toxæmias of pregnancy).

'Neo-Infundin' is issued as a 'Hypoid' product in 0.5-c.c. and 1-c.c. containers in boxes of six. Literature will be sent on request. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.)

Neotropin, a markedly penetrative urinary antiseptic of high bactericidal power for oral administration, is a butyloxy-diamino-azo-pyridine, and is supplied in bottles of 30 dragées of 0.1 grm. (1.5 gr.) and in clinical packings of 250 and 500 dragées.

Neotropin is well tolerated, since the therapeutic dose represents only a small fraction of those which in pharmacological tests produced no secondary effects. It is quickly absorbed and is eliminated by the kidneys and partly also by the liver.

Clinical evidence has shown it to be of pronounced value in infections of the genito-urinary tract and also as a disinfectant prior to surgical interference, as well as in the treatment of bacteriuria, cystitis, pyelitis, pyelonephritis, etc., and in the treatment of retention and gonorrhœal affections.

Neotropin is independent of the condition of the urine, being active both in acid and alkaline urine. The usual dose is two dragées three times a day. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

"Opojex" Ovarian Residue (B.O.C.).—Consists of ovary without corpus luteum. It is claimed that when used as a routine in the first and second stages of labour, intra-muscular injections of this preparation tend to shorten labour enormously, and to render it almost painless, relaxation being so complete that delivery is easy. Post-partum hæmorrhage rarely occurs. This preparation is also useful for the induction of labour. Supplied in boxes of 6 ampoules of 1 c.c. (The British Organotherapy Co. Ltd., 22, Golden Square, W.1.)

Orisol.—A solution of berberine acid sulphate which has been reported as giving successful results in the treatment of Oriental sore by infiltration. (May & Baker Ltd., Battersea, S.W.11.)

Percaine.—This local anæsthetic was referred to in the MEDICAL ANNUAL for 1930. Since then numerous reports have been published emphasizing that it is an ideal local anæsthetic for regional, infiltration, surface, and spinal anesthesia. It acts in extreme dilution, 0.5 to 2 in 1000, and produces anæsthesia of great intensity and duration. It is not a narcotic, and belongs chemically to a class entirely different from cocaine and its derivatives, belonging to the quinoline group of drugs. It is most economical in use.

Percaine is now available in the form of: Crystals, 1 grm. and 5 grm. Tablets for the preparation of solutions: tubes of twenty 0.65-grm. and of ten 0.1-grm. Ampoules: boxes of five 5-c.c. 1-1000 with adrenalin 'Ciba'; boxes of ten 2.3-c.c. 1-1000 with adrenalin 'Ciba'; and boxes of ten 2.3-c.c. 2-1000 with adrenalin 'Ciba'. In addition 20-c.c. ampoules solution 1-1500 in 0.5 per cent NaCl (specific gravity 1.00345, hypobaric) are now available for spinal work only, according to the method of Dr. Howard Jones. (The Clayton Aniline Co. Ltd., 40, Southwark Street, S.E.1.)

'Pitressin' Nasal Jelly is offered as a convenient form for the intranasal administration in the treatment of diabetes insipidus. Pitressin, the pressor principle of pituitary posterior lobe, was separated from pitocin (the oxytocic principle) in Parke, Davis & Co.'s research laboratories; it carries both blood-pressure-raising and antidiuretic properties, and is present in this jelly in the proportion of 10 pressor units per gramme. The intranasal method of administration has been demonstrated to yield satisfactory results in the control of polyuria. Supplied in small metal collapsible tubes of about 3 grm. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

Progynon, the standardized female sexual hormone from the Schering-Kahlbaum Laboratories, is now available in bottles of 30 and 60 dragées (150 mouse units) for oral administration, and in boxes of six 1-c.c. ampoules (100 mouse units) for intra-muscular injection. These replace the former packings of 10 dragées (250 mouse units), which have been discontinued.

A point of considerable importance with regard to progynon is its exact standardization, but perhaps even more important is the form in which the hormone is administered. Extensive experiments have shown that a highly purified preparation may prove comparatively inactive where cruder preparations containing lipid material as a

effluent are able to withstand the gastric juices, and are capable of producing oestrus with a low concentration of the hormone. These investigations have rendered possible the manufacture of progynon in a form where only five times the subcutaneous dose may be given by the mouth and produce oestrus. Its use is indicated in almost every gynaecological condition, with an average dose of 3 to 4 dragées weekly. If a rapid and intense effect is desired 2 to 3 injections weekly of 1 to 2 ampoules should be included in the course of treatment. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Proliferase is a stabilized preparation of active living yeast cells, capable of proliferating at the temperature of the human body, supplied in ampoules for oral administration. For effective yeast therapy the advantages of employing a preparation of living and viable cells in place of other forms, e.g., powder and tablets, in which the cells are either dead or inactive, will be apparent. Proliferase has been adapted to the intestinal secretions, and its biological characteristics are in perfect accordance with medical requirements.

Indicated in constipation and digestive disturbances, anorexia, malnutrition, infectious diarrhoea of infants and adults, acne and furunculosis of intestinal origin, proliferase substitutes itself in the intestines for the pathogenic flora, particularly putrefactive bacteria. It has a mild laxative effect. Rich in vitamin B, it is also an important aid to nutrition and stimulates general metabolism. Supplied in boxes of 8 ampoules of 2.5 c.c. (8 days' treatment). (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1.)

Quinisan.—This is a definite chemical compound—quinine bi-salicylosalicylate—and occurs as a white, odourless crystalline powder having a slightly bitter taste. It is practically insoluble in water, but in the dilute acid gastric juice it separates into quinine and salicylosalicylic acid. Not until it reaches the intestines is the salicylosalicylic acid hydrolysed, there liberating salicylic acid, and thus avoiding the gastric irritation common with other salicylic preparations. Quinisan is stated to have given successful results in influenza, tonsillitis, coryza, and neuralgia. The adult dose is one or two 4-gr. tablets every two hours, four or six times a day, as necessary. (Howards & Sons Ltd., Ilford, London.)

Saliod (Gabail) is a preparation of iodine and salol in ampoules for intramuscular injection in the treatment of rheumatism, sciatica, etc. Each ampoule of 5 c.c. contains 1 gm. of salol and 10 cgrm. of iodine in addition to 2 cgrm. of camphor dissolved in ether-purified olive oil. Put up in boxes of 5 ampoules. (The Anglo-French Drug Co. Ltd.)

Senna Pods.—*Lixen's Brand Elixir of Senna Pods* is a palatable extract of senna pods prepared by a special process which eliminates the griping principle without affecting the laxative properties. One drachm is equivalent to twelve large senna pods. *Lixen's Brand Laxative Lozenges* are fruit-flavoured lozenges each equivalent to half a drachm of 'Lixen' elixir, or six large senna pods. A simple laxative for children. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Sodium Bismuth Thioglycollate.—A neutral water-soluble preparation of bismuth used in the treatment of syphilis, by subcutaneous or intramuscular injection. (May & Baker Ltd., Battersea, S.W.11.)

Sodium Morrhuate.—This is the sodium salt of a fatty acid obtained by saponification of cod-liver oil. It is specially purified for injection treatment of varicose veins. (May & Baker Ltd.)

Sodium Morrhuate Solution has been favourably reported on for the injection treatment of varicose veins, and is claimed by its advocates to have advantages over other solutions used for the same purpose: 5-c.c. 'Glaseptic' ampoules of 5 per cent and 10 per cent strength are supplied. (Parke, Davis & Co., 50-54, Beak Street, W.1.)

Solganal Dragées.—Solganal, the least toxic product in gold therapy, is now available in the form of dragées for oral administration. Hitherto it has only been marketed in the form of 'Solganal' for intravenous injection and 'Solganal B' for intramuscular injection. In this new oral form it is particularly applicable to the treatment of infective arthritis. Clinical investigations show that cases which had been unsuccessfully treated with other rheumatic preparations, and where years of spa treatment had been of no avail, were favourably influenced by Solganal dragées, in many cases being completely cured after four to six weeks' treatment.

Solganal dragées are supplied in bottles of 50 in 0.01-grm. and 0.1-grm. strengths. The usual commencing dose is 0.01 gm. daily, gradually increased by 0.01 gm. daily until 0.1 gm. per day is reached, with an interval on the fifth and twelfth days (Schering Ltd., 3, Lloyd's Avenue London, E.C.3.)

Thromboplastin (P., D. & Co.) is a sterile suspension of comminuted brain tissue for local application in the control of hæmorrhage. When applied to a bleeding surface on sterile gauze it aids in the formation of a firm natural clot. Supplied in packages of 20 c.c. (Parke, Davis & Co.)

Thymophysin (Dr. Temesvary).—This combination of extracts from the thymus and the posterior lobe of the pituitary has been markedly successful in labour during the period of dilatation, where, in contrast with the use of pure pituitary preparations, it may be employed without any fear of causing tonic spasm of the uterus, though it produces strong and rhythmic contractions. It may be used without any harmful effect to mother or child in the period of dilatation in primary and secondary inertia and in premature rupture of the amniotic sac; it is suitable for patients of all ages, and for both primipare and multipare.

Thymophysin may be used also for the induction of labour, combined with castor oil and quinine. The initial dose is 0.5 to 1 c.c., which may be repeated without risk. Thymophysin is delivered in boxes of 3 ampoules of 1.1 c.c. and of 10 ampoules of 1.1 c.c. (Paines & Byrne Ltd., 31, Southampton Street, W.1.)

Uritone (Hexamine) Solution.—Administered by intravenous injection, this is employed for the relief of anæmia and dysuria, and for the treatment of pyelitis, acute nephritis, and spirochetosis. 'Glaseptic' ampoules containing uritone (hexamine) 2 grm. (31 gr.) in distilled water 5 c.c. (85 min.) are supplied. (Parke, Davis & Co.)

Uroselectan is a new preparation which has accomplished a revolution in the X-ray visualization of the kidneys and urinary tract. It is administered by intravenous injection, and is superseding the method of pyelography. In cases where cystoscopy and ureteral catheterization are either undesirable or impossible—stricture, fistula, severe inflammation of the uterine appendages, enlarged prostate, etc., and in pediatrics, it is possible to obtain both anatomical and functional information about the kidneys and urinary tract in a practical and effective manner.

Uroselectan is a water-soluble pyridine derivative with 40 per cent iodine organically combined. It is marketed in bottles of 30 grm. for the preparation of 100 c.c. solution with distilled water. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Vaccine Treatment of Chronic Rheumatic Diseases.—There is a rapidly growing demand for, and interest in, the stock streptococcus polyvalent and *Micrococcus deformans* vaccines prepared by Dr. H. Warren Crowe, and used by him at the Charterhouse Clinic, Crosby Row, London, S.E.1. A number of other clinics have been established and are working with the greatest success. Clinicians in America and European countries also report excellent results and complete cures under the treatment. Descriptive pamphlets available on application. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Ventriculin is a desiccated preparation of stomach tissue which has been shown to have a blood-regenerating effect in cases of pernicious anæmia. It was developed as a result of researches carried out by Dr. E. A. Sharp, of Parke, Davis & Co.'s Department of Experimental Medicine, in collaboration with Drs. Sturgis and Isaacs, of the University of Michigan (*Jour. Amer. Med. Assoc.*, Sept. 7, 1929). Each batch of ventriculin manufactured is submitted to clinical tests designed to demonstrate its hæmatopoietic action before its release for general use. Ventriculin is indicated for the treatment of primary anæmia, in which condition it is often productive of more satisfactory results than liver or liver extract. (Parke, Davis & Co.)

Vioosterol 'A & H'.—A biologically standardized solution of irradiated ergosterol (vitamin D) in oil. Containing 10,000 units of vitamin D in each cubic centimetre. vioosterol possesses one hundred times the vitamin-D activity of good cod-liver oil. *Vioosterol 'A & H' Compressed Tablets* are each equivalent to 5000 units vitamin D or $\frac{1}{2}$ c.c. of vioosterol. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Vitasac.—This is a new infant food entirely different in principle from anything at present on the market, for use in conjunction with sterilized and diluted cows' milk. It is a combination of the primary sugars reinforced by the four vitamins, and contains the essential inorganic constituents in constant proportions. The chief objections to cows' milk are the preponderance of caseinogen, deficiency of sugar, and unreliability of the vitamin content. The formation of hard curds in the stomach, and consequent vomiting by the infant after being fed, is one of the disabilities of a cows' milk diet which Vitasac prevents. It contains 35 per cent of grape-sugar and an equal quantity of fruit sugar, both monosaccharides, and therefore easily assimilated. A sample of Vitasac will be sent to any member of the profession on application to the makers: R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.

Zephrol.—This preparation consists of an oily base in which is incorporated 1 per cent of the alkaloid ephedrine. It has been devised for use as a nasal spray in asthma, hay fever, nasal congestion, catarrh, etc. (May & Baker Ltd., Battersea, S.W.11.)

MEDICAL AND SURGICAL APPLIANCES.

Abdominal Retractor.—We illustrate here (*Fig. 55*) a new abdominal retractor with swivel blades, made for Mr. E. Miles, in stainless steel or chromium plate finish. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)

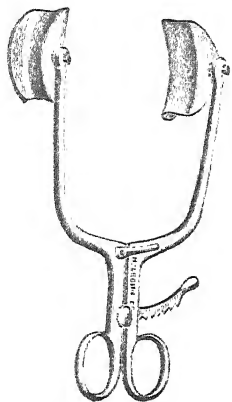


Fig. 55.

It is made for the Samaritan Hospital, Belfast. (Mayer & Phelps, Chiron House, London.)

Airway (Magill's).—This fitting (*Fig. 58*) is intended for the administration of endotracheal chloroform by inhalation from a Junker bottle, where elaborate apparatus is

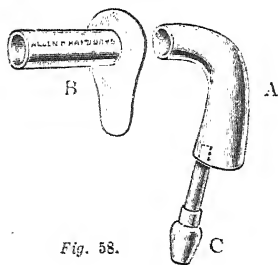


Fig. 58.

not available. The angle-piece (A) is alone employed when the nasal route is chosen, and the extension (B) is fitted when intubation is carried out through the mouth, as in nasal operations. In either case a length of firm-walled rubber tubing of $\frac{1}{8}$ in. to $\frac{3}{8}$ in. calibre is fitted to the metal orifice, and tube leading from the Junker bottle is attached to the extension (C). The pharynx should be packed with gauze during the operation, and to-and-fro breathing is carried on entirely through the tube. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Anæsthesia Apparatus (Magill's).—This apparatus (*Fig. 59*) provides for the administration of nitrous oxide, oxygen, ether, chloroform, and carbon dioxide by inhalation or insufflation. The flow of nitrous oxide and oxygen is measured in litres per minute by accurately calibrated dry flow meters, the bobbin indicators of which are coloured blue and red respectively.

Beard's automatic regulators are used on the cylinders, and the gases can be delicately controlled by taps, adequate pressure of either gas being immediately available.

Abdominal Scissors.—These extra long stainless steel scissors as illustrated (*Fig. 56*) have been made for Mr. E. Miles, for use in abdominal surgery. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)

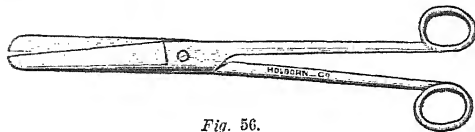


Fig. 56.

Abdominal Swab Stand.—Designed by Dr. W. R. MacKenzie, this stand (*Fig. 57*) is fitted with hooks upon which abdominal swabs may be hung after use, a removable tray catching the drips. The apparatus makes it possible for the surgeon or sister in charge to see and count the swabs, and thus minimizes the danger of one or more being overlooked. Stands with any number of hooks can be supplied. The apparatus runs very

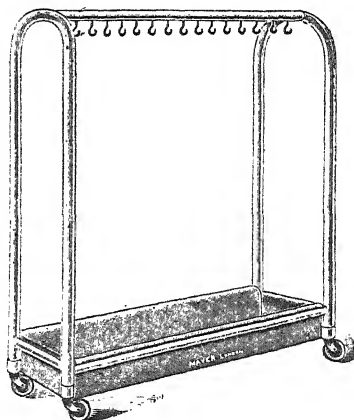


Fig. 57.

The mixed gases can be wholly or partially divided through chloroform by means of a two-way stopcock, or allowed to pass through the heating chamber to the patient.

The heating chamber is formed by the intervening space between two metal cylinders, the innermost of which is filled with hot water. Ether reaches the heating chamber from any standard bottle through a drip feed, and the flow is maintained by occasional use of a hand bellows connected to the bottle.

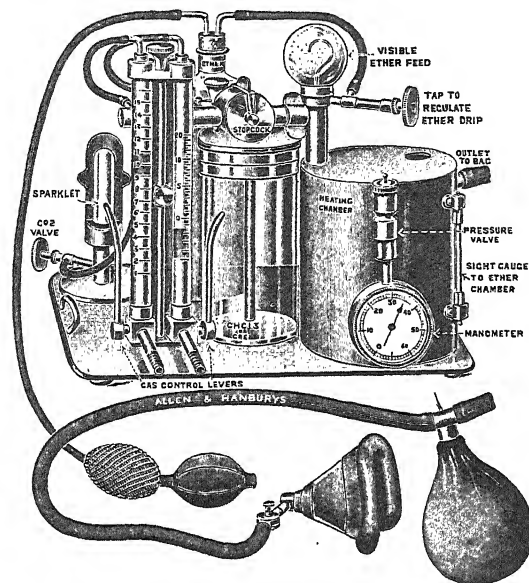


Fig. 59.

Carbon dioxide is obtained from domestic 'Sparklet' bulbs, the container for these being mounted on the base-plate.

When delivering nitrous oxide and oxygen with a face-piece, a half-gallon bag is placed close to the outlet on the apparatus and attached by $3\frac{1}{2}$ ft. of $\frac{1}{2}$ -in. bore tubing to an adjustable spring expiratory valve. This valve is connected to the face-piece by a short elbow junction.

After induction of anaesthesia, the face-piece and elbow junction can be quickly disconnected from the expiratory valve and maintenance carried on by the endotracheal method. (Allen & Hanburs Ltd.)

Artificial Pneumothorax Apparatus.—

This is a modification, by Dr. Geoffrey Marshall, of the apparatus described in 1921. In the former model the air reservoir consisted of a collapsible india-rubber bag, now replaced by a glass cylinder graduated up to 600 c.c. The lower end of this cylinder communicates by flexible tubing with a stout rubber bag of the 'hot-water bottle' type, of the same capacity as the cylinder, and filled with water. When ready for use the bag is suspended by means of a knotted silk cord, as shown (Fig. 60), and on turning the glass two-way tap the water runs into the lower end of the glass cylinder, displacing the air, which is driven into the flexible

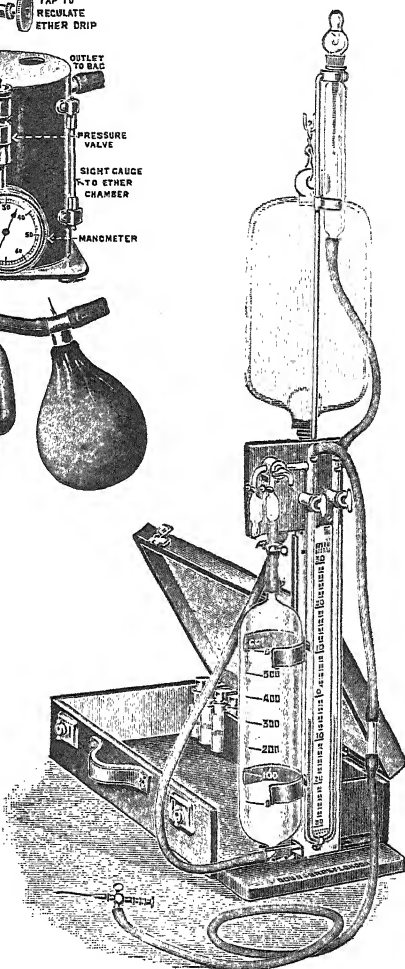


Fig. 60.

tube attached to the needle, the rate of flow being governed by a screw clip at the top of the cylinder. There are three glass bulbs containing sterile wool to filter the air, and a trap prevents loss of water from the manometer in the event of the patient coughing during the operation.

Fitted in the case are four bottles for novocain, iodine solution, etc., also room for pneumothorax needles and syringe for injecting the local anæsthetic. The manometer registers intrapleural pressure, or pressure at which the gas is being injected according to the position of the two-way tap. The apparatus can be used for both injection and withdrawal of measured quantities of gas, and its advantages are that it is easy to handle, light and compact, and can be carried in any position. Its weight is $7\frac{1}{2}$ lb., and it measures in case $19\frac{1}{2} \times 9 \times 4\frac{1}{2}$ in. (Down Bros. Ltd.)

Bed Foot-rest (The "Crommelin").—Made in plain or stained and polished wood, this apparatus (*Fig. 61*) has many advantages, being simple, easily adjustable, and inexpensive. It consists of two slats of wood, one placed under the iron frame of the bedstead, and the other, to which the foot-piece is fixed, is placed over the mattress. These two slats are clamped at each end. A pillow or a cushion may be folded over the foot-piece. (Allen & Hanburys Ltd.)

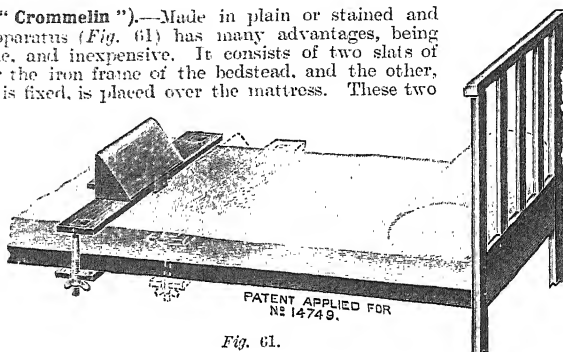


Fig. 61.

Belt for Artificial Limbs.—This attachment consists of a waist-belt (*C*) (*Fig. 62*) furnished with a pair of straps (*E, F*), one secured to the belt in

front, and the other to the rear, thence passing diagonally, crossing each other at the hip-joint, and finally passing around the thigh socket (*A*) and being there secured to the inner side of the socket. These straps are adjustable for length, and at the point of intersection at the hip are arranged to pass freely through a guide (*G*). Where necessary, an additional strap (*H*) is attached to the waist-belt at the outer side and carried straight down through the guide to the top of the socket of the artificial limb. This obviates the necessity for any strap to pass directly downwards at the back of the wearer, securing much greater comfort in sitting.

The attachment retains the leg in its secure position on the stump, not only in standing, but also when the leg is carried to its farthest extent forward or backward, or everted from the body, or crossed over the other leg. In sitting, the leg is held so securely on the stump that the wearer is in perfect comfort in a conveyance, etc., the stump having complete control over the position of the leg. (W. R. Grossmith Ltd., 12, Burleigh Street, Strand, W.C.2.)

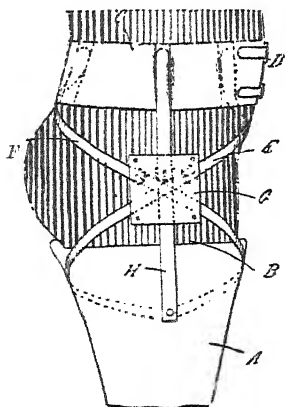


Fig. 62.

Record fitting syringe and the solution may be drawn into the syringe as required.

They are specially useful for carrying local anæsthetic solution for infiltration anaesthesia or 'A.B.A.' If a bayonet catch syringe such as Moynihan-Crile's is used, an adaptor is required for filling the syringe, as described on page 551. For a Record syringe no adaptor is necessary. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London.)

Bottles for Sterile Solutions.—The Hinz-Thim bottles (*Fig. 63*), for the sterile preservation and sterile supply of solutions for injection, can be supplied in either ordinary or Jena glass, and consist of a bottle or flask covered with a glass cap. Under the cap is a glass hollow stopper with extended glass tube reaching to the bottom of the bottle. The upper end of the stopper is hollow to take the nozzle of the

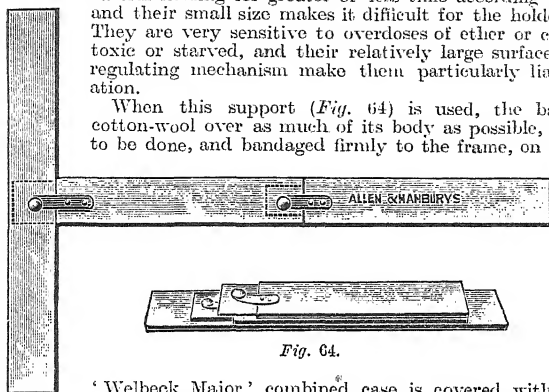


Fig. 63.

Cruciform Support (Denis Browne's).—In operating on babies there are certain special difficulties. Owing to their light weight and powers of contortion they need careful holding for greater or less time according to the type of anæsthetic, and their small size makes it difficult for the holder to avoid the operators. They are very sensitive to overdoses of ether or chloroform, especially when toxic or starved, and their relatively large surface area and defective heat-regulating mechanism make them particularly liable to chills during operation.

When this support (*Fig. 64*) is used, the baby is wrapped in warm cotton-wool over as much of its body as possible, according to the operation to be done, and bandaged firmly to the frame, on which subcutaneous salines

or artificial respiration can be given without removing it. A baby that has been restlessly wriggling and crying will often settle down and go to sleep as soon as it is firmly fixed. (Allen & Hanburs Ltd.)

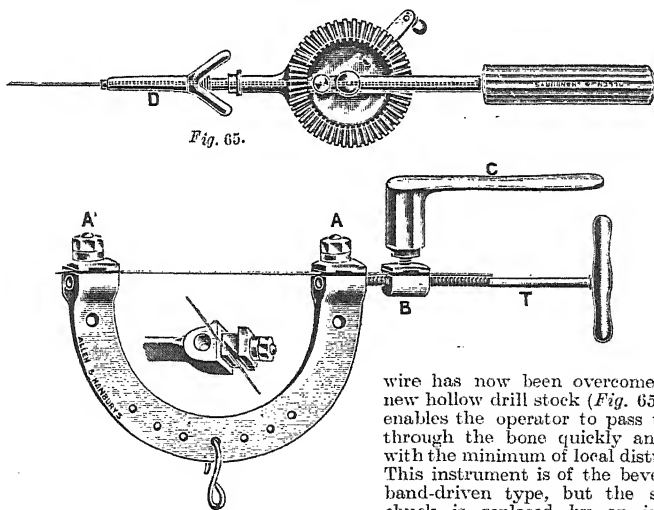


Diagnostic and Midwifery Case.

—This 'Welbeck Major' combined case is covered with best brown cowhide. It should meet the requirements of the general practitioner, particularly when his rounds are carried out over a wide territory and it is imperative to carry a large assortment of requisites. The different drawers isolate the individual items, and the bottles (always upright) allow a sufficient quantity of emergency drugs to be carried in safety.

Sufficient apparatus is included to enable an emergency urine test to be done. The bottom drawer will also accommodate a sterilizer for midwifery forceps which can be carried when required. (Allen & Hanburs Ltd.)

Extension Apparatus (Kirschner's).—Wire extension for the treatment of fractures has obvious advantages over the older methods. The difficulty of introducing the



wire has now been overcome by the new hollow drill stock (*Fig. 65*), which enables the operator to pass the wire through the bone quickly and easily with the minimum of local disturbance. This instrument is of the bevel-wheel, band-driven type, but the standard chuck is replaced by an improved elongated pattern fitted with a fly-nut (D.)

Chromium-plated wire is passed through the long axis of the drill so that the pointed end protrudes about 6 cm. A slight turn of the fly-nut fixes the wire in this position. The wire is inserted through the skin, then gently drilled into the bone until the

shoulder of the chuck comes into contact with the skin. Now loosen the fly-nut and withdraw the drill over the wire so that another six centimetres of the wire is exposed. Re-tighten the fly-nut and continue drilling. The point of the wire will now emerge on the opposite side of the limb. Loosen the fly-nut and remove the stock-drill.

The Kirschner's stirrup (*Fig. 66*) is then applied by loosening nuts A' and A, thus exposing oblique slots into which the wire is fitted. With the spanner (C) tighten the nut A, and attach the tension instrument (T) to the stirrup. Fix the other end of the wire in the holder (B), using the spanner (C) to ensure the wire being firmly gripped. Rotate the T-handle, gradually increasing the tension of the wire until the maximum is reached. Finally tighten nut (A) and remove the tension instrument. (Allen & Hanburys Ltd.)

Extension Pin.—Cyriax's modification of Steinhmann's pin (*Fig. 67*), now in routine use in the orthopaedic wards of St. Thomas's Hospital, differs from the standard pattern in that it has a screw thread at each end on to which fits a winged nut. When cords



Fig. 67.

are attached to the pin the nut prevents their slipping off, and even allows the cords to diverge from the line of the limb—often a great help in removing pressure from bony prominences distal to the point of insertion. The ordinary inserter-handle is used with a screwing motion while the thread is traversing the bone, and the time taken, therefore, is slightly increased. (Allen & Hanburys Ltd.)

Eye Instrument Grip.—The problem of a satisfactory grip or rest for the finger-tips with both spring action and hinge action eye instruments is one which is of great interest to surgeons who practise this type of surgery. Messrs. Down Bros. Ltd., London, S.E.1. have endeavoured to solve the problem by means of a loop finger rest into the centre of which projects a small horn or spike. The tip of the finger sinks into the loop and a sliding movement is arrested by the projecting horn. *Fig. 68* shows a pair of iris forceps constructed with this grip, made for Mr. A. H. H. Sinclair.

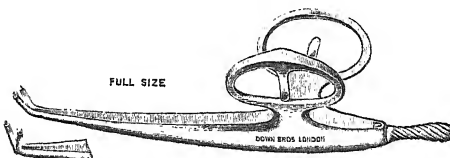


Fig. 68.

Eyelid Retractor.—By means of this retractor (*Fig. 69*), made for Dr. H. M. Traquair, of Edinburgh, a greater degree of control can be obtained than is possible with most types. The swivel action of the blades ensures the parallel opening of the eyelids and the amount of retraction can be regulated by the thumbscrew. The whole retractor, along with the eyelids, can be raised by

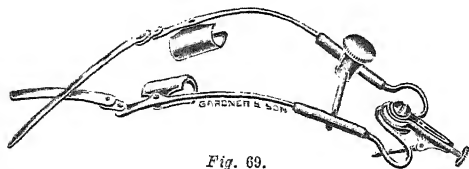


Fig. 69.

means of the flexible strips being bent to the required height and rested on the bridge of the nose in front, while the screw at the back raises the retractor from the temple. (J. Gardner & Son, Edinburgh.)

Face-piece.—The 'A & H' all-rubber face-piece (*Fig. 70*) for use with gas apparatus, Clover's inhaler, etc., is made with a thin bevelled rim, eliminating the necessity of inflating or sponge-rubber pads. It can be sterilized by boiling, and is less costly than the standard patterns. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

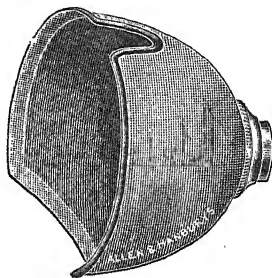


Fig. 70.

Foot Support.—The 'Reality' Valgus Sole (*Fig. 71*) consists of an internal longitudinal arch support made of reinforced cork, in front of which is placed a pad of sponge rubber in such a way as to give upward pressure at each side of the head of the third metatarsal bone. The whole is covered with light basil and is perforated to allow as much ventilation as possible. The total weight of the valgus sole is just over one ounce. When ordering, it is desirable to send a tracing of the patient's foot and some guidance as to the degree of the drop of arch. (Chas. F. Thackray, Park Street, Leeds, and Regent Street, London.)



Fig. 71.

FORCEPS.

Abdominal Forceps.—These stainless steel spring forceps (*Fig. 72*) with 1×2 teeth extra long have been made for Mr. E. Miles for use in abdominal surgery. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)



Fig. 72.

Capsule Forceps.—Dr. G. F. Alexander, of Scarborough, states that failure is apt to occur in the course of a capsulectomy owing to the teeth of the forceps refusing to bite, this being especially the case in hypermaturity, from toughness of the capsule or fluidity of the cortex. While the teeth should be as sharp as possible, they materially tend to bite into the capsule the more vertically they are inclined to it.

A more vertical inclination of the teeth to the capsule is obtained by setting them

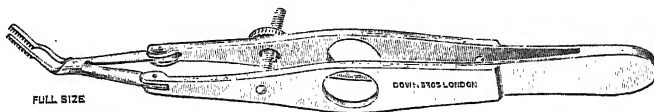


Fig. 73.

on short primary arms, which in turn are opened and closed by long secondary arms as illustrated in *Fig. 73*. The latter are given a ring grip, and provided with a screw stop to limit the range to which the teeth can separate to a distance not exceeding 4 mm. The heels of the short arms are not only separated to the extent of 1 mm., but are raised 1 mm. above the level of the teeth, so that they cannot possibly grasp the iris. (Down Bros. Ltd.)

Comb Dissecting Forceps.—Mr. Walter Salisbury, of Northampton, has designed the forceps illustrated (*Fig. 74*), in which the comb end is rigid and the blades flexible. It embodies the principle of the well-known Kelly's comb, and is most useful in performing the radical operation for cancer of the breast. After the fascia has been divided along the front of the axillary vein with a light touch of the scalpel, the forceps are held in the reverse position and the comb sweeps the axillary contents away from the posterior aspect of the vein, commencing at the apex of the axilla. Branches of

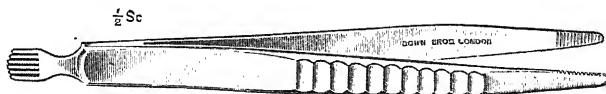


Fig. 74.

vessels and nerves are displayed at their origin and clamped or preserved as desired. The proximity of the comb to the handle enables this to be accomplished with ease and precision.

The forceps are useful for similar types of blunt dissection elsewhere, especially for stripping fascial or omental structures away from vessels, pedicles, ducts, and the necks of hernial sacs. The blades meet at the point only. The instrument serves the double purpose of dissecting forceps and Kelly's comb, so that one instrument less need be taken to a breast operation. (Down Bros. Ltd.)

Hernia Forceps.—These forceps (*Fig. 75*), designed by Mr. J. P. Buckley for invagination of the sac, are of the 'crocodile' pattern, so that the blades may be opened without stretching the hole in the parietes, and to ensure that no abdominal viscous is caught by that portion of the forceps which lies within the abdominal cavity. When *in situ* for the invagination the handles of the forceps lie entirely outside the abdominal muscular wall. (Mayer & Phelps.)

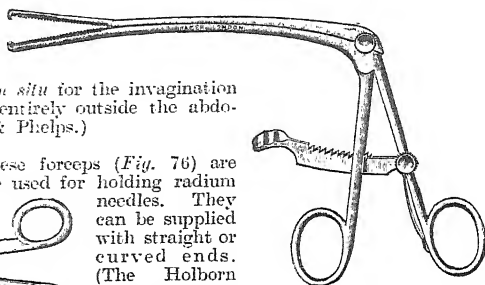


Fig. 75.

Radium Needle Forceps.—These forceps (*Fig. 76*) are made entirely of wood and are used for holding radium needles. They can be supplied with straight or curved ends. (The Holborn Surgical Instrument Co. Ltd.)

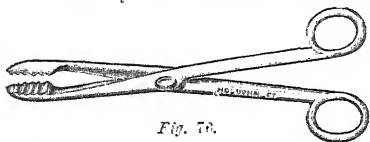


Fig. 76.

Radium Needle Forceps.—Dr. Robert R. Morrison, Radium Officer of the Glasgow and West of Scotland Radium Institute, has designed a special pair of forceps (*Fig. 77*) to assist in the removal of radium needles. The point of the forceps is as fine as possible and tapers gently, and can be used as a probe. When the head of the needle has been located, the forceps can be opened, and with a little care the head of the needle can be gripped into grooves in the point. These forceps are very useful when a needle has become caught in the skin or in the fascial layers, especially if the thread has broken. They are handy also for inserting radium needles in certain situations, as the point of the forceps themselves can be pushed into the tissue along with the needle. (Chas. F. Thackray, Leeds and London.)

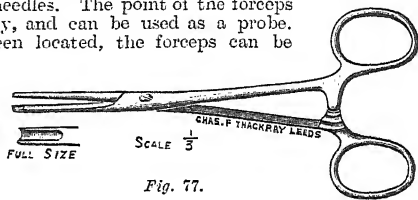


Fig. 77.

Tissue Forceps.—We illustrate (*Fig. 78*) a tissue forceps which does not penetrate or lacerate the structure grasped. The teeth, which are similar to those of Duval's forceps, are set at an angle, and the jaw shanks are very thin and flexible. Although Mr. J. Taylor, of Dundee Royal Infirmary, originally designed them for small gut or stomach, he has found them most useful in injecting large internal hemorrhoids when these tend to be pushed in front of, rather

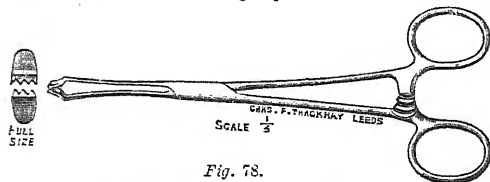


Fig. 78.

than penetrated by, the Blanchard type of needle. When the hemorrhoid is grasped by these forceps it is not lacerated, and by gentle traction the upper limit of the pile mass can be brought into full view and the depth of the needle thereby regulated and the 'blanching' controlled. (Chas F. Thackray.)

Tonsil-holding Forceps (Courtenay Mason's).—An improved forceps (*Fig. 79*) for firmly securing the tonsil whilst enucleating. The blades are semi-blunt and do not tear the tonsil. Made in stainless steel in two sizes. (Allen & Hanburys Ltd.)

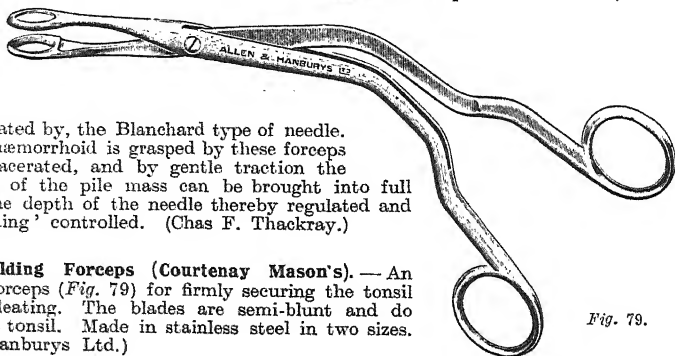


Fig. 79.

Towel-holding Forceps (Higgs's).—A small improved form of towel clip (*Fig. 80*), with the jaws curved either to the right or left. Very useful for operations on the small bones, mastoid, and for plastic work. The handles tend to keep out of the field of operation. Made of stainless steel. (Allen & Hanbury's Ltd.)

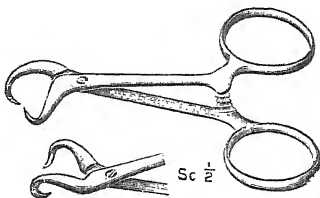


Fig. 80.

Universal Catch Forceps.—The forceps illustrated (*Fig. 81*) were suggested by Dr. Wentworth Taylor. The tip of each blade is fenestrated, the opposing surfaces being surrounded by a small channel into which the grasped tissue bulges slightly and the forceps therefore cannot slip.

The rack is so arranged that when the forceps are closed on the first step the blades are sufficiently open to hold an ovary; at the second step, bowel, stomach, etc., can be held; while at the succeeding steps the forceps

will grasp and hold peritoneum. If used per vaginam the same tool will grasp the puerperal cervix, or withdraw debris from the uterus in cases of abortion, or take specimens from the uterine

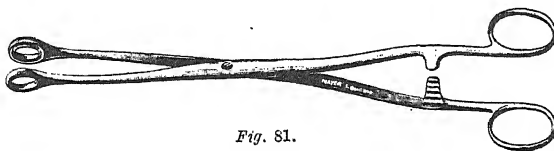


Fig. 81.

cavity for microscopy. (Mayer & Phelps, Chiron House, London.)

Uterine Fixation Forceps.—

This instrument (*Fig. 82*) securely grips and holds the cervix without injury. The lower blade can be detached and used as a uterine probe. It is supplied in stainless steel or chromium-plated finish. (The Holborn Surgical Instrument Co. Ltd.)

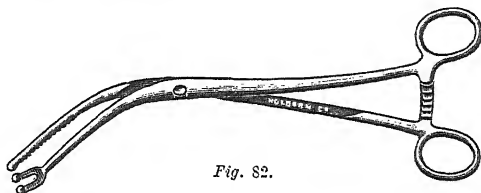


Fig. 82.

Vasostomy Forceps.—These forceps (*Fig. 83*) have been devised for simplifying the procedure of exposing and dividing the vas deferens, as a preliminary to prostatectomy. The vas is first secured through the skin by the thumb and forefinger. The forceps are then made to grasp the whole thickness of the scrotum behind the deferent duct. The vas is then pushed down on to the upper surface of the gripping part of the instrument, which thus secures it behind and prevents it from slipping away. The gripping surfaces are smooth and rounded

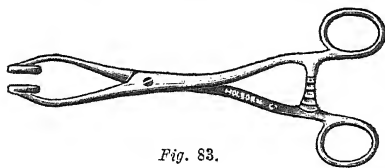


Fig. 83.

to obviate bruising of the tissues. (The Holborn Surgical Instrument Co. Ltd.)

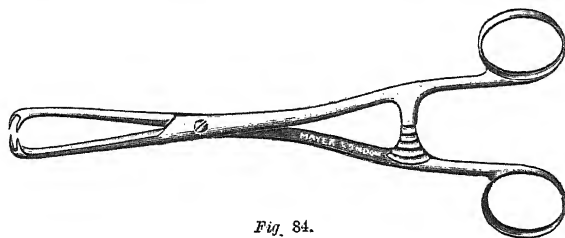


Fig. 84.

Vulsellum Forceps.—Dr. Daniel Douglass designed these forceps (*Fig. 84*) originally for use in the operation of dilatation and curetting in the case of single women. The ordinary vulsellum forceps are clumsy and liable to tear a small cervix. These take a firm grip and yet do not damage the cervix. They are also useful for seizing the mucous membrane or skin edge in colporrhaphy. (Mayer & Phelps, London.)

Gag and Tongue Depressor.—The gag illustrated (*Fig. 85*) was designed by Mr. W. T. Milton with a view to sending patients back to bed efficiently gagged after operations on the nose and throat. It is the only type of gag suited for this purpose, as

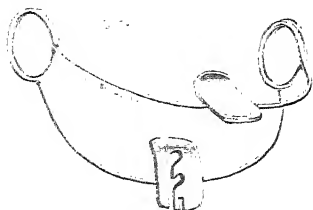


Fig. 85.

those in general use were mostly furnished with projecting handles, which when in contact with the pillow or bedclothes would tend to dislodge the gag.

In addition, Mr. Milton has designed a small tongue tractor (*Fig. 86*) for use in connection with the gag. This tongue tractor, when anchored in the slot cut in one of the finger-plates, is self-retaining.

It is thought that the gag will prove a useful addition to

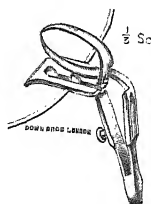


Fig. 86.

the midwifery bag for use in those very frequent cases where the practitioner has to rely on the services of the nurse or midwife for the maintenance of anaesthesia. Both instruments are made throughout in stainless steel. (Down Bros. Ltd.)

Goitre Retractor.—The chief points of this retractor (*Fig. 87*), made for Professor H. H. Searls, of San Francisco, are its simplicity and its unobtrusiveness. The two ends of the retractor readily hold the skin flaps well apart, giving a clear field for operation. Owing to the curve of the instrument it lies closely in to the neck and is quite out of the operator's way. Being only a simple spring it can be easily and quickly applied and removed. (J. Gardner & Son, Edinburgh.)

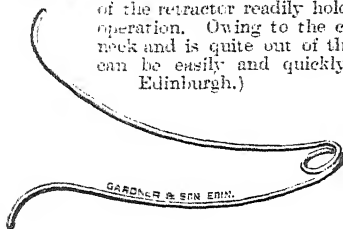


Fig. 87.

Gymnastic Apparatus.—The need for providing some form of exercise for the prevention of post-operative thrombosis has been successfully met by the use of the simple gymnastic apparatus made for Mr. L. R. Braithwaite.

The apparatus consists of a cord threaded through three pulleys, two single pulleys and a double pulley, the latter being fixed to the bed-rail. Two slings of soft padded material are attached to the single pulleys: one of these holds the foot and the other is held by the hand of the patient. The length of the cord can be adjusted to suit the varying heights of different patients. (Chas. F. Thackray, Park Street, Leeds, and Regent Street, London.)

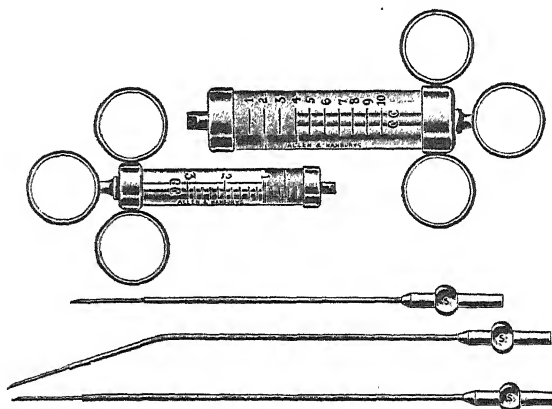


Fig. 88.

Hæmorrhoid Injection Set (Gabriel's).—This instrument (*Fig. 88*) is useful for the high submucous injection of phenol in vegetable oil for the treatment of piles. (Allen & Hanburys Ltd.)

Hæmostatic Bag.—The Pilcher's bag in ordinary use is cone-shaped and tends unduly to dilate the urethra. The bag here illustrated (*Fig. 89*), designed by Professor Fullerton for use after prostatectomy, is round in shape and exerts no pressure on the lumen of the urethra, but fills the prostatic cavity alone, thus avoiding dilatation of the urethra, which is liable to be followed by incontinence of urine. (Mayer & Phelps.)

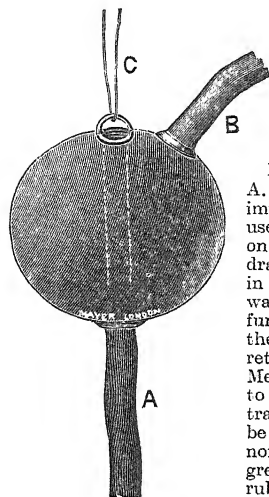


Fig. 89.

Hydrostatic Suction Pump.—Dr. G. A. Metcalfe, of Bedford, has devised an improvement on the hydrostatic pump used for obtaining suction in operations on the nose and throat. One great drawback to the hydrostatic pump now in use is the fact that a good head of water, which is essential for its proper function, tends to blow the pump off the tap. He therefore suggested that retaining hooks should be fitted, and Messrs. Down Bros. Ltd. have brazed to the head four metal hooks, as illustrated (*Fig. 90*), by which the pump can be easily and securely tied on. The noise of splashing can be silenced to a great extent by fixing a length of wide rubber tubing to the outlet and allowing it to open under water in a basin. (Down Bros. Ltd.)

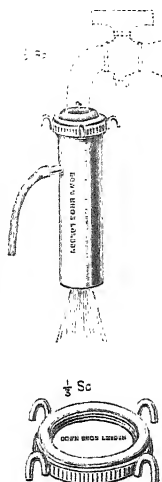


Fig. 90.

Inhaler for Open Ether Administration.—The open method of administration is favoured by many, but is found to be extravagant in cases where deep anæsthesia is required. Further, excess of ether on the ordinary mask is a danger to the eyes and frequently causes soreness to the face.



Fig. 91.

The Safety Inhaler (*Fig. 91*) designed by Dr. W. Stanley Sykes, Anæsthetist to the Leeds General Infirmary, obviates both drawbacks. The only wastage of ether is from evaporation at the top of the reservoir, and, no matter how much anæsthetic is used, it is impossible for it to affect the eyes. Being made of metal, mostly aluminium, it is extremely light and can be boiled without detriment. There are no hinges, set-screws, or fasteners to rust or break. (Reynolds & Branson Ltd., Leeds.)

Ligature Holder (McCullagh's).—This ligature holder (*Fig. 92*) is fitted with a metal clip for attaching to the surgeon's wrist. When another reel of catgut is required the

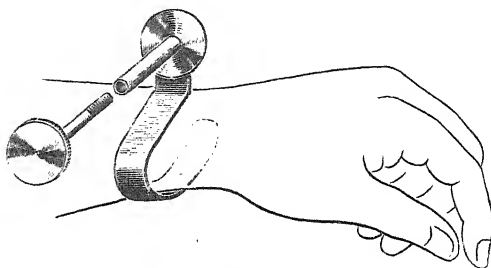


Fig. 92.

holder can be taken apart as shown in the illustration, enabling the transfer to be speedily effected. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Lung Therapeutic Outfit.—The outfit illustrated (*Fig. 93*) is particularly useful for intratracheal injection of lipiodol. It consists of forceps for introducing lung catheters,

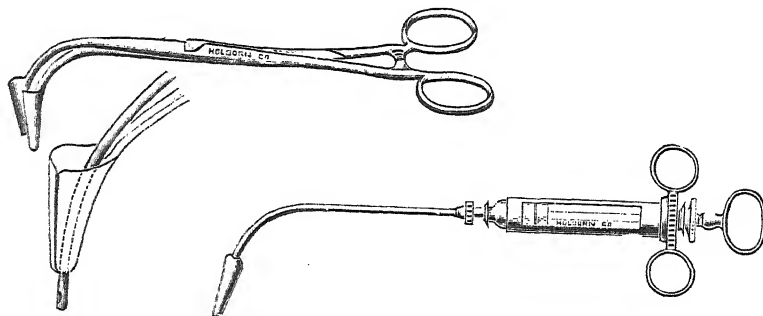


Fig. 93.

etc., an injection syringe with one curved cannula with conical end, one straight cannula, a connecting piece for catheters to screw on the syringe, two gum-elastic catheters, for local anaesthesia, complete in metal case. (The Holborn Surgical Instrument Co. Ltd.)

Mastoid Wound Retractor.

—The illustration (*Fig. 94*) shows a simple self-retaining mastoid wound retractor designed by Mr. W. Mayhew Mollison, which has proved itself most satisfactory in use. It is lightly but strongly made and is so curved that when the jaws are in position the shafts and handle lie conveniently against the head of the patient out of the way. It is fitted with a cam ratchet, which maintains the jaws at any desired width with delicacy and rigidity. The instrument is made of stainless steel. (Down Bros. Ltd.)

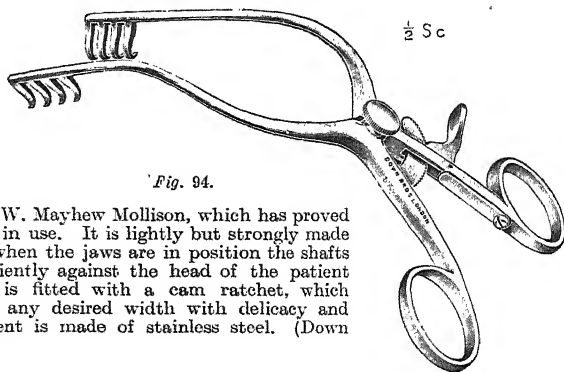


Fig. 94.

Mirror.—Mr. O. O. Popper designed this mirror mainly for the nose, throat, and ear surgeon, but it may also be found useful in other departments of surgery, where

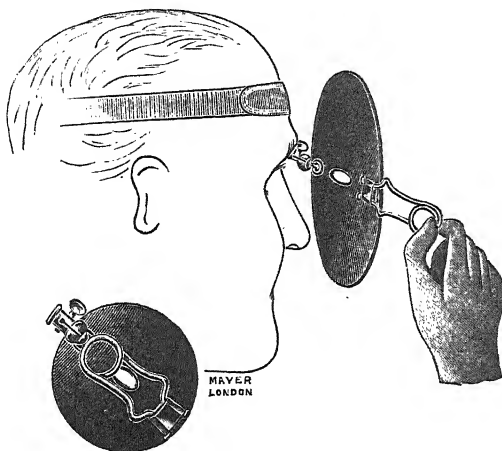


Fig. 95.

one is operating on deep parts (rectum, cervix, etc.), where a strong beam of light is essential, and where it is necessary to

alter the direction of the beam frequently during the course of the operation. The illustration (Fig. 95) is self-explanatory. (Mayer & Phelps, London.)



Fig. 96.

Motor-car Emergency Case.—Specially devised for medical men, this case (Fig. 96) can easily be carried in a motor-car. The contents are varied and include all the usual requirements for use in accidents. The case is made of japanned tin and will be found useful by medical motorists. An illustrated circular of contents will be sent on application to the makers. (C. J. Hewlett & Son Ltd., London, E.C.2.)

Mouth Gags (Denis Browne's).—This gag (Fig. 97) is supplied to the Hospital for Sick Children, Great Ormond Street. It is fitted with an improved patent ratchet, and its lead-lined jaws ensure a secure grip being obtained. (Allen & Hanburys Ltd.)

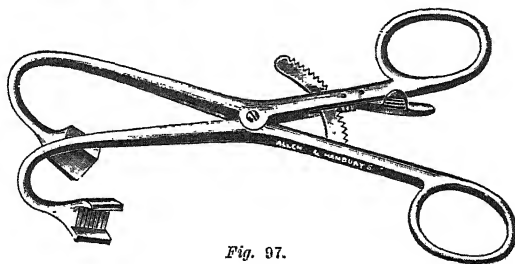


Fig. 97.

Mouth Gag for Ectotulous Children.—This type of gag (*Fig. 98*) is supplied to the same hospital. It is also fitted with a similar ratchet, but its jaws are shaped so as

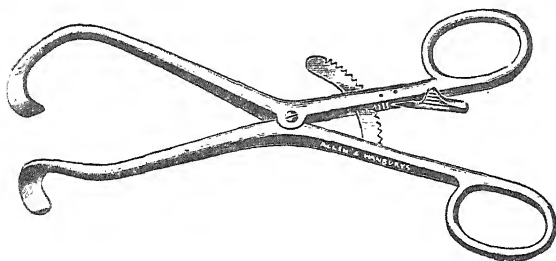


Fig. 98.

to maintain a firm grip on those cases where the ordinary gag is of little use. (Allen & Hanburys Ltd.)

Mouth-opener and Airway.—Messrs. Down Bros. have made to Mr. W. J. McCardie's design a combined metal mouth-opener and airway (*Fig. 99*) which he finds very useful in anæsthetic work. It is flatter than the ordinary boxwood wedge and usual type of airway, and has smooth bevelled ends: it is therefore more easily introduced between the teeth into the mouth, and cannot damage the throat. It is made in three sizes.

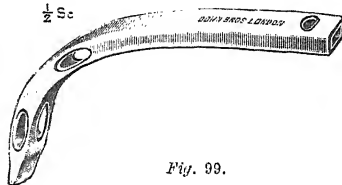
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Fig. 99.

Mucus Catheter (Rufail's).—An improved mucus catheter (*Fig. 100*) as used at the Rotunda Hospital, Dublin. It can be easily taken apart for sterilization and cleaning,



Fig. 100.

and is provided with a trap or 'baffle' to prevent any mucus passing up the suction tube to the mouth of the operator. (Allen & Hanburys Ltd.)

Nail Brush.—This brush is designed to withstand repeated boilings. The back is aluminium, and the unbleached bristles are fixed into this by a patent process. As will be seen from the illustration (*Fig. 101*), the sides are corrugated to afford a firm grip. Invaluable in the midwifery bag. Price 4s. 6d. each. (R. Sumner & Co. Ltd.)

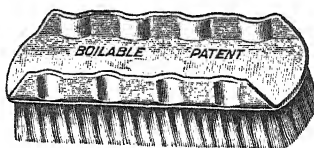


Fig. 101.

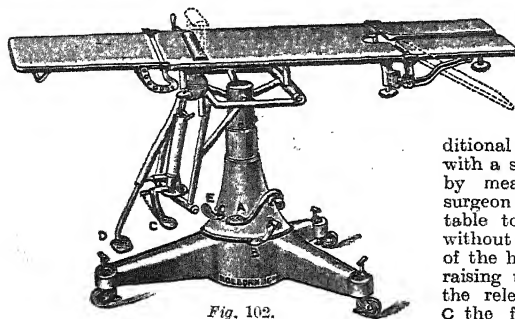


Fig. 102.

Operation Table.—The 'Holborn' New Twin Pump operation table (*Fig. 102*) has all the advantages of an oil-pump table with the additional convenience of being fitted with a small oil pump and foot pedal by means of which the operating surgeon or anæsthetist can tilt the table to the Trendelenburg position without interfering with the sterility of the hands. The foot lever A is for raising the table from the base, B is the releasing pedal for lowering it, C the foot lever for tilting the table

to the Trendelenburg position, D the pedal for automatically returning the table to its original position, and E the releasing lever for use when rotating the table. The head and leg flaps are removable, and the kidney bridge is built into the top of the table. The head flap is lowered or raised by means of an improved 'one-hand' release, and the leg flaps are individually fitted with a screw adjustment. The base is mounted on strong easy-running castors which may be put out of action when desired. All bright parts are chromium plated or stainless steel, the pump and under-carriage aluminium bronzed. (The Holborn Surgical Instrument Co. Ltd.)

Osteoclast.—The osteoclast here illustrated (*Fig. 103*) was made for Mr. Alexander MacLennan, of Glasgow, and is founded on the ordinary steel rail bender. With the screw adjustment (H) the amount of force available is very great, and yet is absolutely under control—a feature entirely absent from the lever osteoclast in general use. To minimize injury to the tissues the resisting arms (A and B) and the plunger (C) are encased in thick rubber tubing. With the employment of even considerable force less damage to the soft parts results if the pressure is only applied for a short time. As the control is so perfect the necessary pressure may be rapidly applied, and once

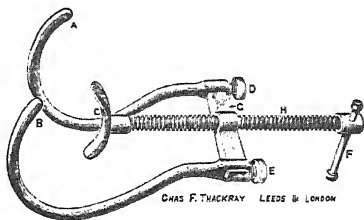


Fig. 103.



Fig. 104.

its action has been achieved the tension may be removed by unwinding the screw. The arms (A and B) are adjustable on the bar (G) by the screws (D and E) so that curves of various diameters may be treated. The bar (F) slides in its sockets, so that extra leverage may be applied to the screwed plunger (H). (Chas. F. Thackray, Leeds.)

Oxygen Inhaling Apparatus (Burrell's).—Patients who obtain relief from oxygen inhalations will find this small portable apparatus (*Fig. 104*) useful when travelling. The oxygen is contained in miniature cylinders similar to the 'Sparklet' bulbs, and each cylinder holds sufficient oxygen fully to expand the rubber bag provided. The capacity of this bag is approximately one gallon. The small cylinders can be refilled. (Allen & Hanburys Ltd.)

Periosteum Elevator.—This chromium-plated stripper (*Fig. 105*), made for Mr. Morriston Davies, is for use when extensive rib resection is necessary. It can be used with safety for removing the periosteum off ribs that are not fully exposed. The one shown is for use on the right side of the chest, but it is also made for the left side. (The Holborn Surgical Instrument Co. Ltd.)



Fig. 105.

Pharyngo-laryngoscope.—This improved instrument (*Fig. 106*), made for Dr. E. E. Burnier, being very much smaller than usual, is better borne by a sensitive patient, and is especially useful in examining children. The lens, being placed at the extreme end of the instrument, gives a most excellent view of the post-nasal space and of the larynx. With

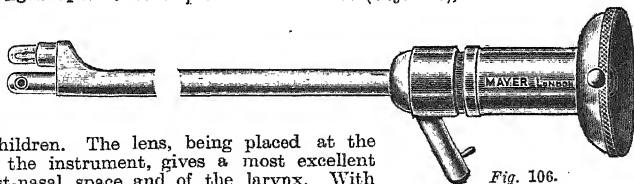


Fig. 106.

the light switched on, the pharyngoscope should be introduced in the mouth, pressing lightly on the tongue to get under the arch of the soft palate, the patient being told to close his mouth and breathe through the nose so as to bring the soft palate forward. (Mayer & Phelps, London.)

Pneumothorax Needle.—A new pneumothorax needle (*Fig. 107*) has been designed by Dr. Frederick Heat. It is made so that information of the position of the point as it goes through the chest wall is given by the manometer before the stylet is withdrawn.

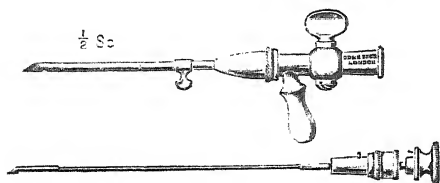


Fig. 107.

The needle is of the orthodox 'Clive Riviere' pattern and has a terminal and lateral opening, but does not obstruct the lateral opening. It is kept in position by a small pin which fits into the opposite end of the instrument. This prevents the stylet turning round when in use. The needle is sharp-pointed, slightly bevelled, and when passed into a patient's chest, with the stylet in use, gives a reading on the manometer of the lateral orifice enters the pleural cavity. It has been found in practice that the lateral orifice does not get blocked in passing through the chest wall. It is particularly useful in induction of the treatment. (Down Bros. Ltd.)

Pocket Iodine (the 'Allenburys').—This provides a novel, clean, and satisfactory method of carrying and applying iodine. The iodine is supplied through a pad in the nozzle of the container, thus eliminating the use of a brush. Made of vulcanite like



Fig. 108.

a fountain-pen, the appliance (*Fig. 108*) is very compact and can be conveniently carried in the vest pocket or handbag, ready for immediate use. When necessary refill with tincture of iodine by simply unscrewing the swabholder. (Allen & Hanburys Ltd.)

Proctoscope.—The illuminated proctoscope (*Fig. 109*) has been designed by Mr. Peter G. McEvedy specially to meet the requirements in the modern treatment of hæmorrhoids by injections.

The illumination is obtained by a standard pocket torch inserted into the handle. The torch can be withdrawn and the instrument sterilized. The handle, set at a convenient angle, allows the instrument to be manipulated with ease. The conical shape gives ample room for injections to be made whilst the mucous membrane remains under observation. As a rule injections are made with the slide in position. The instrument can then be rotated without reinserting the obturator. The site of the injection can be accurately determined by withdrawing the lateral slide.

The instrument is equally useful in routine rectal examinations and in minor rectal surgery. For use in operative work a similar instrument on a slightly larger scale is more useful. (Down Bros. Ltd.)

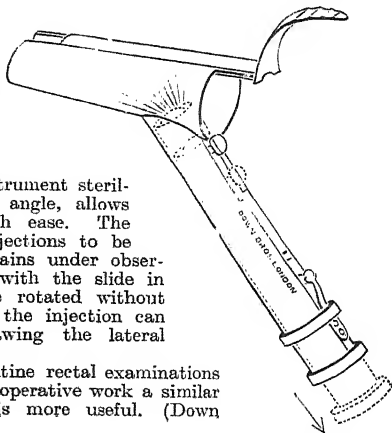


Fig. 109.

Prostatic Electrode.—The hinged metal rods of this latest model (*Fig. 110*) are covered with rubber tubing. In use they are bent at right angles and placed under the patient's thighs. By this means the electrode is kept in position. The terminal can be attached

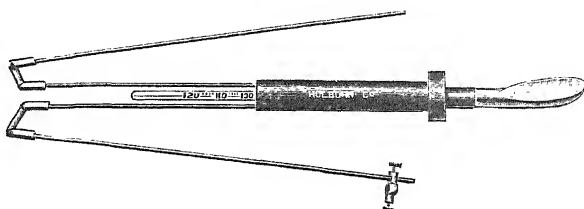


Fig. 110.

to either rod. Made for Dr. E. P. Cumberbatch for treatment of gonococcal infection by diathermy. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)

Radium Needle Introducer (Crow's).—A specially constructed radium needle introducer for use in the less accessible parts of the pharynx (epiglottis, pyriform fossa), and possibly the uterus and rectum. In the middle region of the lower pharynx the need

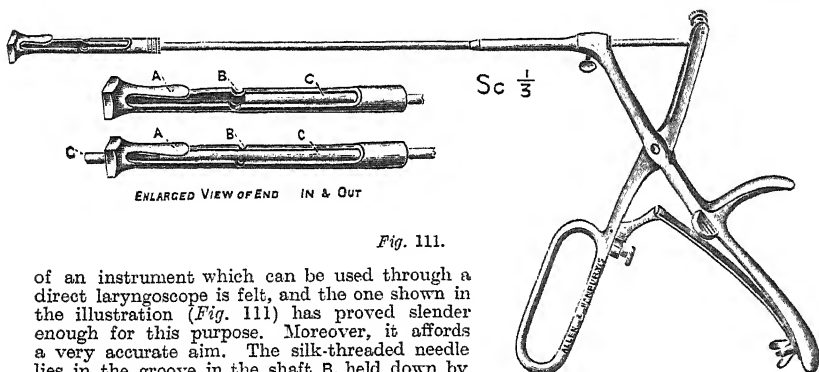


Fig. 111.

of an instrument which can be used through a direct laryngoscope is felt, and the one shown in the illustration (*Fig. 111*) has proved slender enough for this purpose. Moreover, it affords a very accurate aim. The silk-threaded needle lies in the groove in the shaft B, held down by a spring (A), and is propelled by a movable bar (C) through a countersunk opening in the square-ended, rough-surfaced footpiece which is held firmly on to the surface of the growth, all movements being slow and gentle to avoid damage to the silk thread. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Radium Needle Introducer.—Designed by Mr. R. Brooke, of Worthing, this instrument (*Fig. 112*) consists of a hollow trocar (A) with a bevelled needle point, and slotted on its upper surface. In this passes a stylet (B C). A revolving cylinder, measuring $1\frac{1}{2}$ in. in length, contains twelve chambers, each slotted on its outer surface and designed for the reception of the radium needles. Each chamber is loaded with a threaded needle before use; the threads are drawn out of the slots on the outer surface and passed beneath the small metal flange (D) which anchors them until they are required. The handle by which the instrument is held is indicated by E.

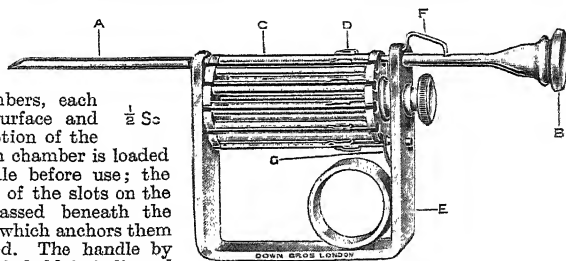


Fig. 112.

The trocar is first introduced into the tissues with the stylet in position. When the required depth has been reached the stylet (B) is withdrawn. The restraining catch (F) prevents the stylet from being drawn out completely. The cylinder is then

rotated until the first chamber comes into line with the trocar; this point is automatically regulated by a ball catch (G). The stylet is next pushed home, and the threaded needle forced through the trocar into the tissues, the thread lying in turn in the slot on the upper surface of the chamber and in the slot of the trocar. The stylet is then withdrawn, and the cylinder again turned until the next chamber is engaged, when a second needle is introduced; or the trocar may first be withdrawn and re-introduced at a fresh spot. This instrument saves the time wasted during an operation in the threading of needles and in their introduction with forceps by the surgeon into the trocar each time. The needles are all threaded by the sister before the operation, and the chambers loaded. (Down Bros. Ltd.)

Radon-seed Introducer.—The introduction of large numbers of radon seeds is a somewhat tedious process, and Mr. H. S. Souttar has designed a magazine introducer (Fig. 113) with a detachable magazine carrying ten seeds.

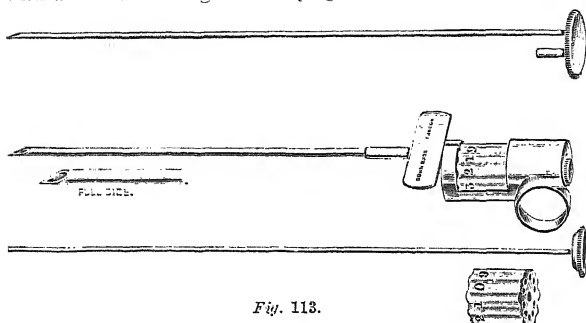


Fig. 113.

The introducer is held in the left hand, and the magazine is rotated by the thumb, while the plunger is pushed in with the right hand. In this way ten seeds can be pushed home with great rapidity, whilst they can be planted in rows with remarkable accuracy, the cannula being withdrawn a centimetre or so after the introduction of each seed. The saving of time is considerable, but perhaps even more important is the gain in precision in the distribution of seeds. (Down Bros. Ltd.)

Record Syringe Case.—This novel device (Fig. 114) is for keeping all size Record syringes (up to 20 c.c.) in lysol solution ready for use. The case comprises a glass container fitted into a nickel-plated metal base, and has a nickel-plated lid. The fitting which carries the syringes and needles can be lifted upwards out of the solution. This is brought to rest on the side edges of the glass container by means of an automatic device, four legs being shot outwards transversely. The syringe required can then be selected for use. To replace the rack in the solution, the four legs are drawn in by lifting the finger-piece placed on top of the rack. Price, case only, 45s., or complete with syringes, 75s. (R. Sumner & Co. Ltd., Liverpool.)

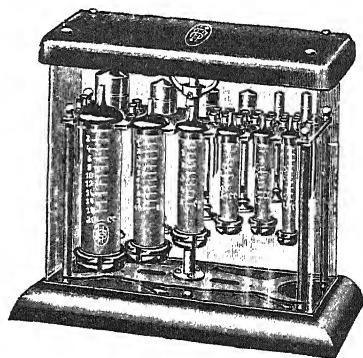


Fig. 114.

Record Syringe Needles.—The trouble previously experienced of needles leaking between the needle mount and the syringe is entirely eliminated by the provision of the new soft metal lining (Fig. 115) to the mount of these needles. This lining adapts itself to any slight deviation from the standard in the nozzle of a Record syringe, and ensures a perfectly liquid-tight connection. Made in stainless steel in all sizes and lengths for hypodermic and serum injections and or exploring and aspirating. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

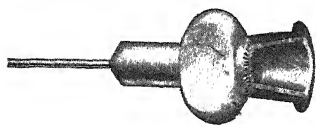


Fig. 115.

Rectal Electrode.—This electrode (*Fig. 116*) was made for Dr. E. P. Cumberbatch for treatment of gonococcal infection by diathermy. It is constructed of lead and

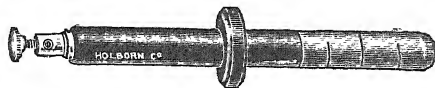


Fig. 116.

vulcanite, with adjustable vulcanite stop. (The Holborn Surgical Instrument Co. Ltd.)

Rectal Speculum (Gabriel's).—A modification of the well-known Kelly's proctoscope. The tubular part of this instrument (*Fig. 117*) is a quarter of an inch longer than usual, allowing a working length of $2\frac{1}{2}$ in., this length being often required for giving high submucous injections in the treatment of hemorrhoids. The handle is broad and flat, 5 in. in length; it is set at an angle of 115° and renders the instrument easy to manipulate and control. The finish is in chromium plating. (Allen & Hanburys Ltd.)

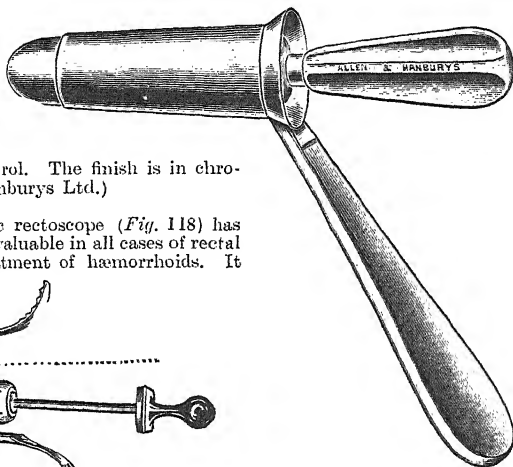


Fig. 117.

Rectoscope.—This electric rectoscope (*Fig. 118*) has many new features and is invaluable in all cases of rectal diagnosis and injection treatment of hemorrhoids. It

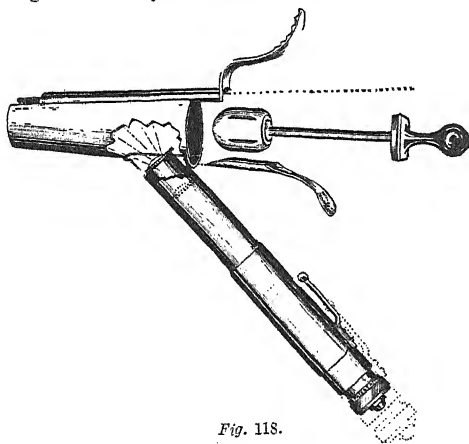


Fig. 118.

gives perfect illumination, and with the sliding blade withdrawn the wall of the anal canal and rectum can be seen the whole length of the speculum. The protector cover prevents faeces, etc., from soiling the lamp when the obturator is withdrawn. The speculum can then be thoroughly cleaned out, the protector cover removed, and the lamp pushed up to the 'forward' position.

The torch is fitted with a patent switch to give continuous light—leaving the operator with both hands free; it is also detachable so that the instrument may be sterilized. The price is 36s. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow.)

Retractor.—The purpose of this instrument (*Fig. 119*), made for Mr. H. Winsbury White, is to simplify the procedure of stitching the internal urinary meatus to the stump



Fig. 119.

of the urethra during the operation of perineal prostatectomy. After the prostate is removed the tractor is passed into the bladder through the perineal wound, when the blades are opened, and by applying traction the internal urinary meatus is brought

well into the operator's view. The two blades come together and are separated on the same principle as is applied to Young's prostatic tractor, but the blades of this are not fenestrated. They are butterfly-shaped, so that when open there is a broad surface applied to the mucous aspect of the bladder, thus allowing for application of a good deal of force while traction is applied without the risk of the instrument slipping or damage to the bladder wall. (The Holborn Surgical Instrument Co. Ltd.)

Retractor for Bone-plating Operation.—Maurice Pearson's retractors (*Fig. 120*), owing to their slightly clawed edges which meet behind the *linea aspera*, and to their weighted

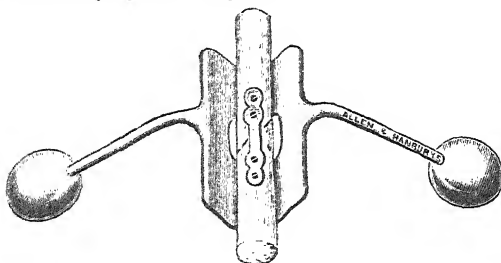


Fig. 120.

and their weighted outer extremities tend to lift forward the bone and restore its natural anterior bow. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Rib Raspatories.—These raspatories (*Fig. 121*), as made for Mr. R. Davies-Colley, are a modification of those designed by Mr. Morrision Davies, the blade being wider

and without the second curve at the distal end, the sharp edge being carried right round the curve to the stem. They are used in pairs, one from above posteriorly, and the other from below anteriorly (or vice versa). Owing to the shape and curve they are as easy to use with the left hand as the right, and being made without the extra curve at the end of the blade they can be used without any fear of damaging the surrounding tissues, the periosteum being removed from the whole surface of the rib in the least possible time. (Down Bros. Ltd.)

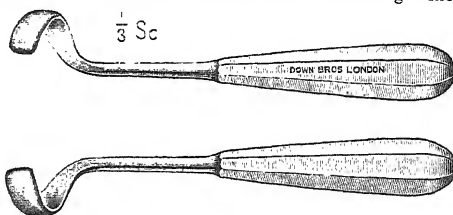


Fig. 121.

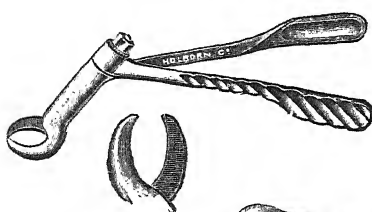


Fig. 122.

Rib Shears (Tudor Edwards's).

—The shears here illustrated (*Fig. 123*) are used for cutting the posterior ends of ribs when performing thoracoplastic operations.

The compound-action joint gives great power with little exertion on the part of the operator. Made in stainless steel. (Allen & Hanburys Ltd.)

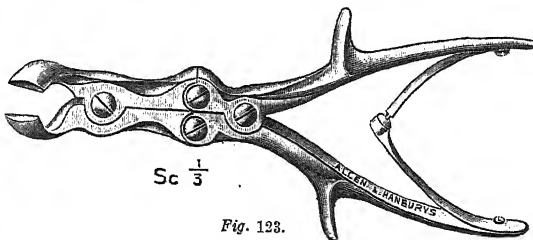


Fig. 123.

Rib Shears.—These shears (*Fig. 122*) were designed by Mr. Morrision Davies to cut the ribs with a minimum of exertion and without causing the bone to splinter. They are made for both right and left sides. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.)

Rib Stripper.—Mr. Morrision Davies has devised a double-ended rib stripper (*Fig. 124*) to facilitate the easy stripping of the periosteum from the surface and edges of the ribs,



Fig. 124.

from behind forwards along the top of ribs, and from before backwards along the lower edge. It may be had nickel-plated or of stainless steel. (The Holborn Surgical Instrument Co. Ltd.)

Skull Plough.—This instrument (*Fig. 125*) was designed by Mr. Lambert Rogers for osteoplastic craniotomy. Its advantages over other methods of cutting cranial bone flaps are: (1) Flaps of any size or shape can be rapidly cut, without the necessity of introducing guards, as the brain and meninges are adequately protected from injury; (2) There is no concussing force, such as occurs with the punching-out type of craniotome; (3) It is not necessary to make a central opening; (4) The groove is narrow and can be cut on a bevel, so that the flap can be accurately replaced.

A full description of the operation appears in the *British Journal of Surgery*, October, 1930. (Mayer & Phelps, London.)

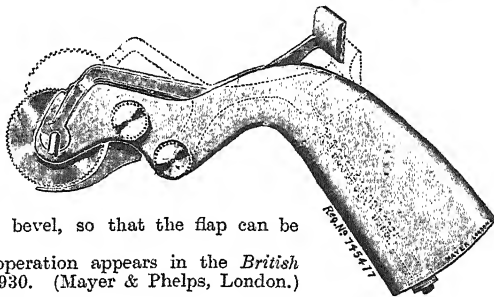


Fig. 125.

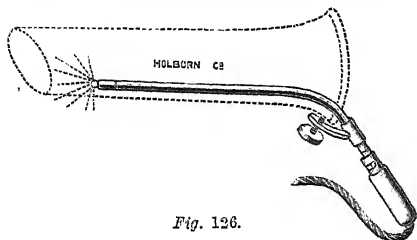


Fig. 126.

Speculum Electric Attachment.—This attachment (*Fig. 126*), made to fit any Fergusson speculum, was suggested by Mr. Keith Duff. It is fitted with plug terminals to fit a battery case. The lamp is easily renewed and the cords are detachable for sterilization. (The Holborn Surgical Instrument Co. Ltd.)

Speculum (Hæmorrhoidal).—Mr. J. Taylor, of Dundee, advocates that in every case of internal hæmorrhoids one should insert first a square-ended (*Fig. 127*) and

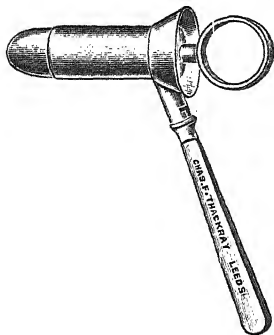


Fig. 127.

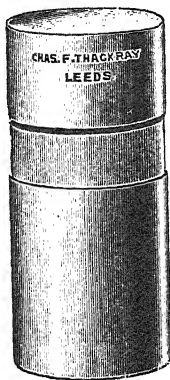


Fig. 129.

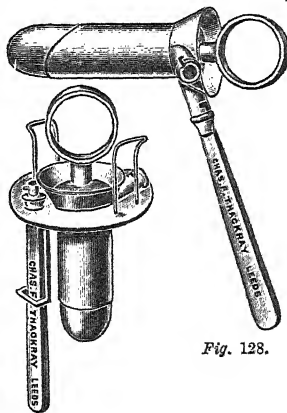


Fig. 128.

then an oblique type of speculum (*Fig. 128*). The appearance of the pile mass varies with

the type of speculum, and sometimes the square-ended and at other times the oblique speculum will be the more suitable to use when injecting. To derive full benefit from the oblique type, the handle is made detachable and two sockets are provided. With the handle in the fold of the nates the 12 and 6 o'clock pile areas can be examined with one of the sockets, and the 3 and 9 o'clock areas with the other socket in use. This is a distinct advantage, for the ordinary oblique-ended speculum cannot be rotated, as the handle fouls the prominent buttock, necessitating a certain amount of withdrawal of the speculum which precludes a thorough view of the area to be injected. The speculum has a long barrel and is put up in a portable metal case (*Fig. 129*) which can be sterilized. The square-ended pattern is also made with a detachable handle and metal container. (Chas. F. Thackray, Leeds and London.)

Stainless Steel Utensils.—Messrs. Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.1, in conjunction with one of the most celebrated cutlery firms in Great Britain, have manufactured an entire range of utensils, which are used in routine hospital work, in 'Stay-bright' stainless steel.

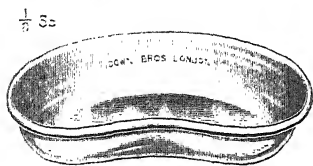


Fig. 130.

The illustration (*Fig. 130*) shows the familiar kidney dish manufactured in this material. Other patterns are illustrated in their advertisement pages.

The 'Empire' brand of 'Staybrite' steel utensils can also be obtained from Mr. Chas. F. Thackray, Park Street, Leeds, and Regent Street, London. These utensils are unaffected by certain chemicals which corrode ordinary stainless steel.

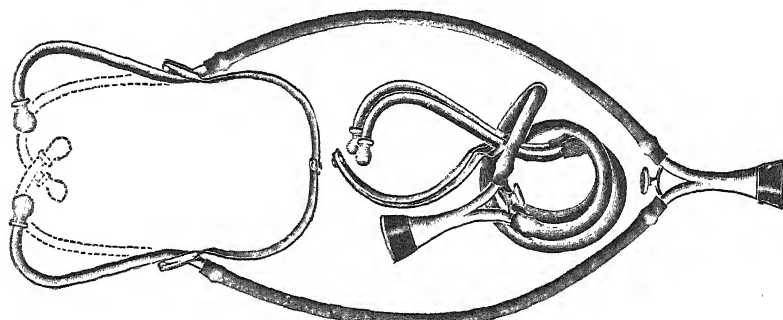


Fig. 131.

Stethoscope.—Dr. Black's Double Folding Stethoscope (*Fig. 131*) has a folding spring, with the tubes again folding down. It takes up little space, and can be conveniently carried in the hip pocket. Price 12s. 6d. each. (R. Sumner & Co. Ltd., Liverpool.)

Suture Case.—The Sumna Spirit-tight Suture Case enables the surgeon to carry his ligature and suture needles (already sterile in alcohol) in the emergency or midwifery bag. The spool for the ligature is placed centrally upon an upright fitting into which the screw on the lid is threaded. The outside of the lid has a knurled edge to facilitate its being screwed home to a spirit-tight fit. The contact is metal to metal, so that there is no washer to give trouble. The needles are carried as shown in the illustration (*Fig. 132*). Price 7s. 6d. each. (R. Sumner & Co. Ltd.)

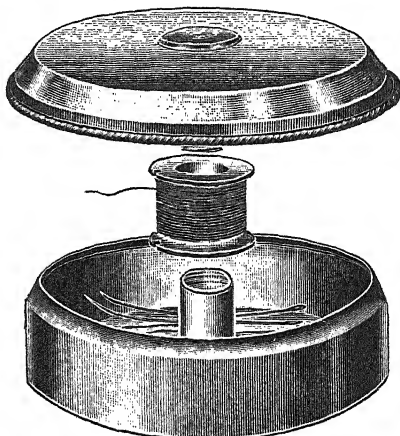
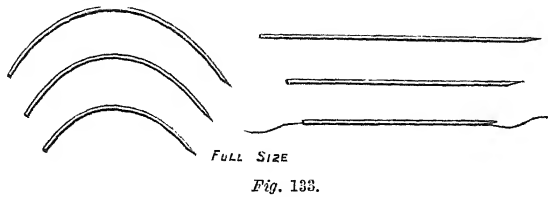


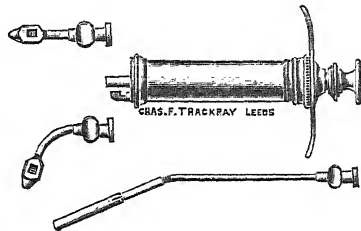
Fig. 132.

Suture Needles (Tidey's).—For suturing superficial wounds of conspicuous parts, these hollow needles (really unmounted injection needles) (*Fig. 133*) have proved excep-



tionally useful. A supply can be kept ready threaded with horsehair or silkworm gut, and sterilized when the occasion arises for their use. (Allen & Hanburys Ltd.)

Syringe.—The illustration (*Fig. 134*) shows a Moynihan-Crile syringe of 10 c.c. capacity and a modified Morley-Blanchard needle as used by Mr. J. Taylor, of Dundee, in phenol-almond-oil injection technique for internal hæmorrhoids. The Morley-Blanchard needle has a lug to take the bayonet catch of the syringe so that there is no risk of syringe and needle coming apart even although an oily solution is being used. The two smaller fittings have similar bayonet lugs and take Schimmel needles. They are used to inject any local anæsthetic or 'A.B.A.' (W. S. Gabriel) in the treatment of pruritus ani. For 'A.B.A.' a 5-c.c. size of Moynihan-Crile syringe is very convenient. (Chas. F. Thackray, Leeds and London.)

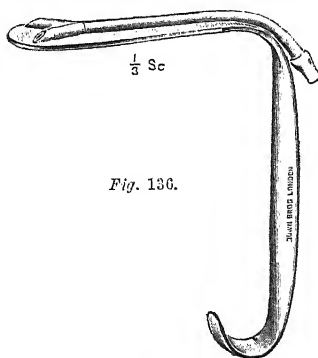


Syringe Adaptors.—The adaptors here illustrated (*Fig. 135*) were designed by Mr. J. Taylor, of Dundee, to fit the Moynihan-Crile syringes for use with the Hinz-Thim sterile



bottles (described under 'Bottles', see page 532). The adaptor is attached to the syringe and the Record nozzle end inserted in the lumen of the stem of the bottle. The syringe can then be rapidly filled, the adaptor is detached, and a Schimmel needle fitted affixed for injecting 'A.B.A.' or other solution.

By the use of these adaptors and the Hinz-Thim bottles, a great saving in time is effected, for the heating and breaking and then emptying the usual 2-c.c. ampoules is tedious and not devoid of soiling. (Chas. F. Thackray.)



Tongue Depressor.—This new irrigating tongue depressor (*Fig. 136*) was designed by Mr. C. Osmond Bodman. When connected with a Higginson syringe or irrigating can, it serves the purpose of douching the tonsil fossæ with an antiseptic solution after dissection of tonsils. The instrument, which is non-resisting, is made by Messrs. Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.

Tonsil Exploring Hook.—The instrument illustrated (*Fig. 137*) has been designed by Mr. C. Osmond Bodman for use in the investigation and after-treatment of tonsil cases.

It is of convenient size and shape for lifting the anterior faucial pillar off the tonsil, for raising the tonsil from the posterior pillar, for pressing upon the tonsil to squeeze out secretion, and for investigating crypts. The instrument is made in stainless steel, and

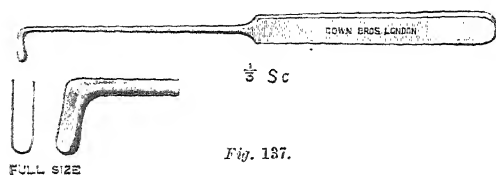


Fig. 137.

being somewhat hollowed and rounded, admirably serves the above-mentioned purposes without causing any injury. (Down Bros. Ltd.)

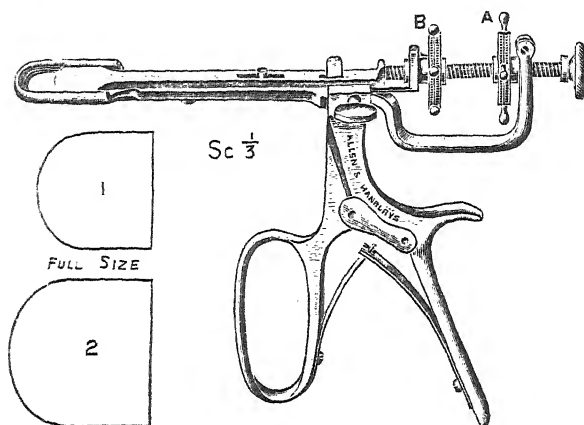


Fig. 138.

Tonsil Guillotine (La Force's).—This hæmostatic guillotine (Fig. 138), as modified for Mr. F. G. Wrigley, is fitted with a powerful crushing blade and a keen cutting blade. It is made in both carbon and stainless steel. (Allen & Hanburys Ltd.)

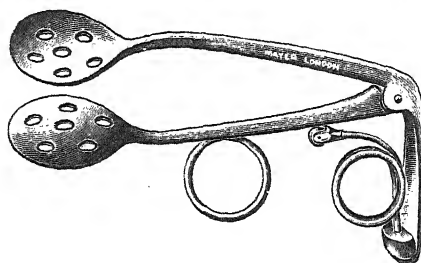


Fig. 139.

Tonsil Hæmorrhage Clamp.—This clamp (Fig. 139) has been designed by Mr. B. Seymour Jones to exercise compression upon the empty tonsil bed, after the right tonsil has been removed by dissection and while the left is being dissected out. It is used in conjunction with a swab of cotton-wool, enclosed in a piece of gauze, with a long tail to it which is brought outside the mouth and tucked under the clamp at the angle of the jaw. (Mayer & Phelps, London.)

Traction Frame for Fractures of the Leg.—This portable extension apparatus (*Figs. 140, 141*), designed by Dr. Norman Flower, is for use in hospitals not equipped with special orthopaedic facilities. It is simple and quick to adjust, and while possessing enormous power, any degree of extension can be provided without effort, as gradually and as gently as desired, in order to overcome muscular contraction without unnecessary damage to the soft parts.

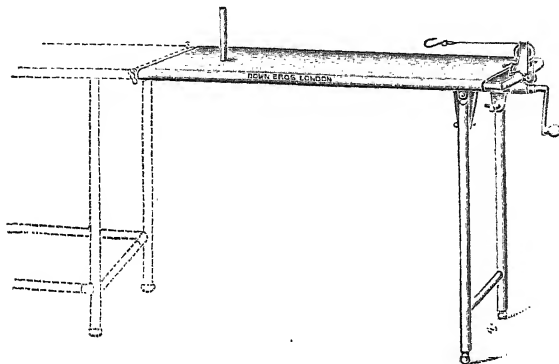


Fig. 140.

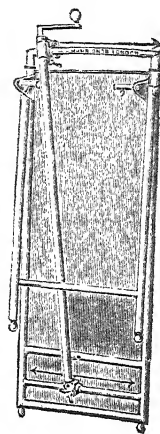


Fig. 141.

If open operation is required, the actuating mechanism is distant from the site of the wound. The desired result is obtained with less disturbance of the periosteum and the neighbouring tissues than is inevitably produced by powerful manipulation with forceps, or by turning the ends of the bone out of the wound, in the attempt to engage the fragments in shoehorn fashion. It should be readily adaptable to any ordinary type of operating table.

The legs of the table, which are adjustable for height, are made to fold, and the perineal post is detachable. The frame can, therefore, be readily transported from the surgeon's house to the hospital, and in those hospitals where space is limited it can be easily stored away when not in use. (Down Bros. Ltd.)

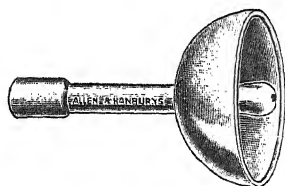


Fig. 142.

Urethral Irrigator Nozzle (Harkness).—This is an all-metal fitting with bulbous nozzle (*Fig. 142*) for urethral injection, similar to the glass nozzles supplied to St. Peter's Hospital, London. (Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

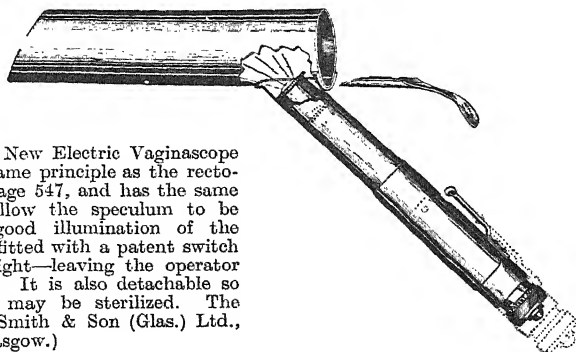


Fig. 143.

Vaginoscope.—The New Electric Vaginoscope (*Fig. 143*) is on the same principle as the rectoscope illustrated on page 547, and has the same protector cover to allow the speculum to be cleaned. It gives good illumination of the cervix. The torch is fitted with a patent switch to give continuous light—leaving the operator with both hands free. It is also detachable so that the instrument may be sterilized. The price is 30s. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Glasgow.)

BOOKS OF THE YEAR.

A LIST OF THE PRINCIPAL ENGLISH MEDICAL WORKS AND NEW EDITIONS
PUBLISHED DURING THE TWELVE MONTHS ENDING DECEMBER, 1930.

* For the convenience of our readers any of the works in this list can be obtained through
Messrs. John Wright & Sons Ltd., 'Medical Annual' Offices, Bristol.

AMBULANCE AND NURSING.

- BACTERIOLOGY APPLIED TO NURSING. By J. Broadhurst and L. I. Given. 8vo, pp. 322, 289 illus. *Lippincott* Net 12s. 6d.
HYGIENE FOR NURSES. By J. Guy and G. J. I. Linklater. Cr. 8vo, pp. 212. 18 illus. *Livingstone* Net 5s.
LESSONS IN MIDWIFERY FOR NURSES AND MIDWIVES. By M. C. Anderson. Cr. 8vo, pp. 228. 20 illus. *Black* Net 6s.
OBSTETRICS FOR NURSES. By C. B. Read and C. L. Gregory. 3rd ed. 8vo, pp. 399, 144 illus. *Kimpton* Net 12s. 6d.
OUTLINE IN OBSTETRICS FOR NURSES. By F. W. Rice. Cr. 8vo, pp. 228. Illus. *Kimpton* Net 8s. 6d.
PRACTICAL MIDWIFERY FOR NURSES. By B. Solomons. 8vo, pp. 354. *Oxf. Univ. Press* Net 8s. 6d.
SURGICAL NURSING. By R. Howard. Cr. 8vo, pp. 336. *Arnold* Net 7s. 6d.
TEXT-BOOK OF MASSAGE FOR NURSES AND BEGINNERS. By Maude Rawlins. Cr. 8vo, pp. 144. Illus. *Kimpton* Net 8s. 6d.
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TEXT-BOOK FOR MENTAL NURSES. By E. L. Macaulay. Cr. 8vo, pp. 276. *Faber & Faber* Net 5s.
TEXT-BOOK FOR NURSES. ANATOMY, PHYSIOLOGY, SURGERY AND MEDICINE. By E. W. Hey Groves and J. M. Fortescue-Brickdale. The Medical Section revised by J. A. Nixon. 4th ed. 8vo, pp. 642. *Oxf. Univ. Press* Net 20s.
TEXT-BOOK OF PHYSIOLOGY FOR NURSES. By W. G. Christian and C. C. Haskell. 2nd ed. 8vo, pp. 153. Illus. *Kimpton* Net 8s. 6d.
TEXT-BOOK ON THE NURSING AND DISEASES OF SICK CHILDREN. For Nurses and Welfare Workers. By Various Authors. Edited by A. A. Moncrieff. Demy 8vo, pp. 594. 111 illus. *Lewis* Net 15s.
THEORY AND PRACTICE OF NURSING. By M. A. Gullan. 3rd ed. Demy 8vo, pp. 262. 3 col. illus. *Lewis* Net 9s.

ANATOMY, PHYSIOLOGY, HISTOLOGY, MICROSCOPY, BIOLOGY.

- ACTION OF MUSCLES; INCLUDING MUSCLE REST AND MUSCLE RE-EDUCATION. By Sir C. Mackenzie. 2nd ed. Demy 8vo, pp. 304. 100 illus. *Lewis* Net 12s. 6d.
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ANATOMY, DESCRIPTIVE AND APPLIED. By H. Gray. 24th ed. Edited by Prof. T. P. Johnson. Illus. *Longmans* Net 42s.
BAILLIÈRE'S SYNTHETIC ANATOMY. By J. E. Cheesman. Part VII: The Thorax. Part VIII: The Abdomen. 8vo. *Baillière* Each Net 3s.
BUCHANAN'S MANUAL OF ANATOMY. Re-issue in 2 vols., 5th ed. Demy 8vo, pp. 1710. 810 illus. 35s. DISSECTION GUIDE. Demy 8vo, pp. 312. 10 illus. 10s. 6d.
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- ELEMENTARY ZOOLOGY FOR MEDICAL STUDENTS. By L. A. Borradaile. 2nd ed. Cr. 8vo, pp. 398. *Oxf. Univ. Press* - Net 10s. 6d.
- FEMALE SEX HORMONE. By R. T. Frank. 8vo, pp. 335. 86 illus. *Baillière* Net 25s.
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- INTRODUCTION TO HUMAN EXPERIMENTAL PHYSIOLOGY. By F. W. Lamb. 8vo. 59 Diags. *Longmans* - Net 12s. 6d.
- MANUAL OF PHYSIOLOGY. By H. W. Lyle and D. de Souza. Cr. 8vo, pp. 820. With 3 Plates and 132 illus. *Oxf. Univ. Press* - Net 16s.
- MANUAL OF SURGICAL ANATOMY. By L. Beesly and T. B. Johnston. 3rd ed. Cr. 8vo, pp. 564. *Oxf. Univ. Press* - Net 18s.
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The Lawn Registered Hospital, Lincoln. Res. Med. Supt., Mary R. Barkas, M.Sc., M.D., B.S.Lond., D.P.M. Lincoln station, 1 mile. *See also Advt., p. 109*

Liverpool.—*Shafesbury House,* Formby, near Liverpool and Southport. Res. Phys., C. J. Tisdall, M.B., Ch.B. Formby, ½ mile. *See also Advt., p. 111*

Tue Brook Villa, Liverpool, E. Res. Med. Supt., John Murray Moyes, M.B., Ch.B., D.P.M. Tue Brook station, ¾ mile, or Green Lane car. *See also Advt., p. 117*

London. — *Bethlem Royal Hospital*, Monks Orchard, Eden Park, Beckenham, Kent. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. See also *Advt.*, p. 101
Brooke House, Clapton, E.5. Res. Med. Supt., Dr. Gerald Johnston, Clapton, L. & N.E.R.

Camberwell House, 33, Peckham Road, S.E.5. Senior Phys., H. J. Norman, M.B., Ch.B., D.P.H. See also *Advt.*, p. 110

Chiswick House, Moss Lane, Pinner, Middlesex. Res. Med. Supt., Douglas Macaulay, M.D. Pinner station, $\frac{1}{2}$ mile.

See also *Advt.*, p. 100

Clarence Lodge, Clapham Park, S.W.4. Res. Licensee, Miss F. Thwaites, Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel.: 6494 Brixton.

See also *Advt.*, p. 112

Featherstone Hall, Southall (for ladies). Res. Med. Lic., A. N. Leatham, M.R.C.S., L.R.C.P. Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill, S.W. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. Tel.: Streatham 8430. See also *Advt.*, p. 116

Flower House, Carford, S.E.8. Med. Supt., Wm. F. Unney, M.D. Res. Lic., Mrs. Walter & Beckett. S.E. & C. Rly., Beckenham Hill, 5 minutes.

See also *Advt.*, p. 115

Halliford House, Upper Halliford, Shepperton, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, $\frac{1}{2}$ miles.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell, Hayes, 2 miles.

Hendon Grove Private Mental Home (ladies only), Hendon, N.W.4. Res. Med. Off. and Licensee, Dr. H. R. S. Walford. Hendon Central (Hamstead Line), $\frac{1}{2}$ mile.

London County Council Mental Hospitals (under the direction of the Mental Hospitals Dept., Artillery House, Artillery Row, Victoria Street, S.W.1):—

Banstead, near Sutton, Surrey. Res. Med. Supt., A. A. W. Petrie, M.D., F.R.C.S. Belmont station, $\frac{1}{2}$ mile; Sutton station, $\frac{1}{2}$ miles.

Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.R., $\frac{1}{2}$ miles.

Cane Hill, Coulsdon, Surrey. Res. Med. Supt., S. C. Elgee, O.B.E., L.R.C.P. & L.R.C.S. (I.). Coulsdon South or Coulsdon North (S. Rly.), 10 minutes.

Claybury, Woodford Bridge, Essex. Res. Med. Supt., G. Foster Barham, M.D. Woodford station, L. & N.E.R., $\frac{1}{2}$ miles.

Colney Hatch, N.11. Res. Med. Supt., J. Brander, M.D., Ch.B., M.R.C.P. New Southgate, L. & N.E.R.

Ewell Colony, Epsom. Res. Med. Supt., L. H. Wootton, M.C., M.B., B.S. Epsom, S. Rly.

Hanwell, Southall. Res. Med. Supt., A. W. Daniel, M.D. Hanwell, G.W.R., 1 mile.

Horton, Epsom. Med. Supt., J. R. Lord, C.B.E., M.D., F.R.C.P.E. Epsom, S.R., $1\frac{1}{2}$ miles.

Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Epsom, $1\frac{1}{2}$ miles.

West Park, Epsom. Res. Med. Supt., Norcliffe Roberts, O.B.E., M.D. Epsom, S. Rly., $1\frac{1}{2}$ miles.

Maudsley Hospital (L.C.C.), Denmark Hill, S.E.5. For cases of incipient mental disorders (voluntary boarders only). Med. Supt., E. Mapother, M.D., F.R.C.P.

See also *Advt.*, p. 55

Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W.17. Private Mental Hospital for a limited number of ladies and gentlemen. Phys. Supt., Dr. Noel Sergeant. Balham station, 1 mile; Trinity Road Station (Underground), $\frac{1}{2}$ mile. Motor bus Nos. 49, 49a, 49b, and 19a. See also *Advt.*, p. 115

Northumberland House, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Finsbury Park stations (Underground & G.N.), $\frac{1}{2}$ mile. See also *Advt.*, p. 102

Otto House, 44, Sydenham Hill, S.E.28. Lic. Prop., Capt. F. H. Little. Lady Supt., Miss Brodie. West Kensington station, 1 mile.

Peckham House, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also *Advt.*, p. 110

Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

St. Luke's Hospital for Mental Diseases (re-building). (Offices, 19, Nottingham Place, W.)

The Priory, Roehampton, S.W.15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

Tooting Bec Hospital (L.C.C.), Tooting Bec Road, S.W.17. For 2290 patients (both sexes). Med. Supt., P. M. Turnbull, M.C., M.B., Ch.B.

West Ham Mental Hospital, Goodmayes, Essex. Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.

Wyke House, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. Edin. Isleworth and Osterley stations, 1 mile. See also *Advt.*, p. 110

Londonderry.—*District Asylum.* Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Mental Hospital, Parkside.* Res. Med. Supt., H. Dove Cormac, M.B., M.S., D.P.M. Macclesfield, 1 mile. *See also Advt., p. 116*

Maidstone.—*Kent County Mental Hospital.* Res. Med. Supt., A. C. Hancock, M.C., M.B., B.S., D.P.H., D.P.M. Maidstone West, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House.* Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

Melrose, N.B.—*Roxburgh, Berwick, and Selkirk District Asylum.* Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton (Suffolk).—*St. Audry's Hospital for Mental Diseases.* Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

Menston (near Leeds).—*West Riding Mental Hospital.* Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S., 1 mile.

Merstham (Surrey).—*County Mental Hospital, Netherne, near Coulsdon.* Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro' (Yorks).—*St. Luke's Hospital.* Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbro', 2 miles.

Monaghan (Ireland).—*District Mental Hospital.* Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ¼ mile.

Montrose, N.B.—*The Royal Asylum.* Res. Med. Supt., C. J. Shaw, M.D. Dubton, 1 mile; Montrose, 3 miles.

Morpeth.—*Northumberland Mental Hospital.* Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Mental Hospital.* Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital, Gosforth.* Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

Northampton.—*Berrywood Mental Hospital.* Res. Med. Supt., Dr. F. J. Stuart. L.M. & S. (L. & N.W.) station, 2½ miles; L.M. & S.R. (Mid.), 3 miles.

St. Andrew's Hospital, Northampton. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. *See also Advt., p. 103*

Norwich.—*Bethel Hospital for Mental Diseases.* Res. Med. Supt., S. J. Fielding. M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile.

See also Advt., p. 105

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall, Norwich. Res. Phys., Dr. G. Stevens Pope, J.P. Med. Supt., Dr. J. A. Small. Thorpe station, 1½ miles.

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S., 1 Whitlingham, 1 mile; Norwich, 2½ miles.

The Grove, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McIntock.

Nottingham.—*City Mental Hospital,* Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

Notts County Mental Hospital, Radcliffe-on-Trent, near Nottingham. Res. Med. Supt., H. C. Waldo, M.R.C.S., L.R.C.P. Radcliffe-on-Trent, 2 miles.

The Coppice, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, 2½ miles; L. & N.E.R. station, 1½ miles. *See also Advt., p. 104*

Omagh (Co. Tyrone).—*District Asylum.* Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

Oxford.—*County and City Mental Hospital, Littlemore.* Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles. *See also Advt., p. 106*

Paisley.—*Craw Road Asylum.* Res. Med. Off., Miss Margaret Hamilton, M.B., Ch.B., D.P.H. Paisley, 1 mile.

The Mental Hospital, Riccartbar, Paisley. Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, ¼ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, 2½ miles.

Perth.—*District Asylum, Murthly.* Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

Plympton.—*Plympton House,* Plympton, Devon. Res. Prop., Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also Advt., p. 114*

Portlaoighise (Queen's County).—*District Mental Hospital.* Res. Med. Supt., Dr. Pierce Grace. Portlaoighise, ¼ mile.

Portsmouth.—*City Mental Hospital.* Res. Med. Supt., Thomas Beaton, O.B.E., M.D., B.S. (Lond.), F.R.C.P. Clerk and Steward, John C. Kersey. Fratton, 1½ miles. *See also Advt., p. 109*

Prestwich (near Manchester).—*County Mental Hospital*. Res. Med. Supt., Dr. D. Blair. Prestwich, $\frac{1}{2}$ mile.

Rainhill (nr. Liverpool).—*County Mental Hospital*. Res. Med. Supt., Dr. E. F. Reeve. St. Helens, $2\frac{1}{2}$ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange*, 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., $\frac{1}{2}$ mile.
See also Advt., p. 111

St. Albans.—*Herts County Mental Hospital*, Hill End. Res. Med. Supt., Dr. W. J. T. Kimber. Hill End station, L. & N.E.R. (G.N. Section), 3 minutes.
See also Advt., p. 117

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk.

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Laverstock House*, Salisbury. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, $1\frac{1}{2}$ miles. *See also Advt., p. 100*
Old Manor Mental Hospital, Salisbury. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes.
See also Advt., p. 112

Shrewsbury.—*Solop Mental Hospital*, Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury, $2\frac{1}{2}$ miles.

Sleaford.—*Kesteven Mental Hospital*. Res. Med. Supt., N. K. Henderson, B.A., LL.B., M.B., Ch.B., D.P.H., D.P.M. Raueby, L. & N.E.R., $\frac{1}{2}$ mile.

Sligo.—*District Mental Hospital*. Res. Med. Supt., Dr. P. O'Doherty. Sligo, $1\frac{1}{2}$ miles.

Stafford.—*County Mental Hospital*. Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also Advt., p. 113

Stirling.—*District Mental Hospital*, Larbert. Res. Med. Supt., R. B. Campbell, M.D. Larbert, $1\frac{1}{2}$ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital*. Res. Med. Supt., H. Kerr, M.D. Aylesbury, $3\frac{1}{2}$ miles.

Talgarth.—*Mid-Wales Counties Mental Hospital*. Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

Tamworth (Staffs).—*The Mount House* (for ladies). Res. Medical Attendant, Dr. W. Lowson. Tamworth station, $\frac{3}{4}$ mile.
See also Advt., p. 114

Taunton.—*Somerset & Bath Mental Hospital*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House*. Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

Virginia Water.—*Holloway Sanatorium*, Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., Henry Devine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harper, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., John G. Hamilton, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Catherine M. Hext, D.P.M., M.B., B.S. (Lond.). Virginia Water Station, 5 minutes. Seaside Branch, St. Ann's, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D.

See also Advt., p. 107

Wadsley (near Sheffield).—*South Yorkshire Mental Hospital*. Res. Med. Supt., W. J. N. Vincent, C.B.E., M.D. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

Wakefield.—*West Riding Mental Hospital*. Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

Wallingford (Berks).—*Berkshire Mental Hospital*. Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital*. Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, $3\frac{1}{2}$ miles.

Warrington (Lancs).—*Lancashire County Mental Hospital*, Winwick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D., D.P.H. Warrington, $2\frac{1}{2}$ miles.

Waterford.—*Bon Sauveur Mental Home*, Carriglea, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. D. T. McCarthy. Dungarvan station, $3\frac{1}{2}$ miles.

District Mental Hospital, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford. (For gentlemen.) Conducted by the Brothers of Charity. Superior, Rev. Bro. Regulus Bourko. Vis. Phys., Dr. M. Coghlan. Waterford station, 1 mile.

Wells.—*The Mental Hospital*, Wells, Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R. and G.W.R., $1\frac{1}{2}$ miles.

Whittingham (near Preston).—*County Mental Hospital*. Res. Med. Supt., Dr. R. M. Clark.

Winchelsea (Sussex).—*Peritsea House*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking (Surrey).—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, ¼ miles.

York.—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also Advt., p. 78
The Friends' Retreat, York. Res. Med. Supt., Dr. Neil Macleod. York station, 1½ miles. *See also Advt., p. 77*

The Pleasance, York (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles.

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

York City Mental Hospital, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

MENTAL DEFICIENCY ACT, 1913 : CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BERKSHIRE.

Cumnor Rise, Oxford. — 34 females. High-grade feeble-minded. Managers, Committee. Supt., Miss A. Haigh. (*Class A.*)

BUCKINGHAMSHIRE.

Manor House, Aylesbury. For both sexes. Supt., Miss E. Boughton.

Winslow Institution, Winslow. — 9 male, 33 female, adults. Feeble-minded and imbecile. (*Class B.*)

CARMARTHENSHIRE.

Pantglass Hall, Llanfynydd Road, Carmarthen. For 90 females. Supt., Miss M. Treharne Jones. (*Class A.*)

CHESHIRE.

Ashton House, 26, Village Road, Oxton, Birkenhead. For 40 females (high grade). Lady Supt., Miss O. M. Wilkinson. (*Class A.*)

Sandlebridge, near Alderley Edge. — 378 males and females. Educable mentally defective children under 13 years of age. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-minded. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

CUMBERLAND.

Durran Hill House, Carlisle. — 65 females. Feeble-minded. Higher grade. Apply, Superintendent. (*Class A.*)

DERBYSHIRE.

Thornhill, Trowels Lane, Derby. For females. Supt., Miss S. McGarvie.

Whittington Hall, Whittington, near Chesterfield. — 400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

DEVON.

Stoke Lyne, Withycombe, Exmouth. 50 males. Managers, Devon County Council. Supt., Miss H. E. Darlington. (*Class A.*)

Western Counties Institution, Starcross. — 559 males and females (trainable children). Sec. Supt., C. W. Mayer. (*Class A.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne. — 79 males. Supt., A. H. Piggott. (*Class A.*)

Shotley Bridge Colony, Shotley Bridge, Durham. 201 males, 172 females. Matron, Miss H. L. C. Yates.

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow. — 61 high-grade boys. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E.17. (*Class A.*)

Brunswick House, Mistley. For 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Supt., S. E. Dudley. (*Class A.*)

Etlow House, Church Road, Leyton. — 102 high-grade feeble-minded females, over 16. Corresponding Manager, as for Bigods Hall. (*Class A.*)

Royal Eastern Counties Institution, Colchester. — 1340 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

The Mutual Sanatorium, Billericay. — 54 males of the middle class. Supt. Sec., Mr. A. J. Read. The Mutual Sanatoria Ltd. (*Class A.*)

Walsham How Home, 1, Forest Rise, Walthamstow, E.17. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. For 45 females. Lady Supt., Miss Stephens. (*Class A.*)

GLAMORGANSHIRE.

Argemone Hall, Skerwen, near Neath. For 70 females. *Hensol Castle, Pontyclun, Glam.* For 100 males. Med. Supt., Dr. E. Lewis. (Class A.)

GLOUCESTERSHIRE.

Brentry Colony, Westbury-on-Trym, Bristol.—327 males over 18 years of age. Med. Supt., Dr. R. Fitzroy Jarrett. Clifton Down, Redland, or Patchway stations, 3½ miles. (Class A.)

Royal Fort Home, St. Michael's Hill, Bristol.—30 females, high-grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Mrs. Brown, "Trecarrel," Rylstone Grove, Parry's Lane, Bristol. (Class A.)

St. Mary's Home, Painswick, near Stroud.—29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—790 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also *Advt.*, p. 80

Stoke Park Colony, West Side, Stapleton.—308 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stapleton Institution, Bristol.—120 adult males, 140 females and 40 children. Superintendent, A. F. Waters. (Class B.)

HAMPSHIRE.

Coldeast Colony, Salisbury, near Southampton. For females. Med. Supt., Dr. A. Wilson.

Mount Tabor, Basingstoke, Hants.—Church of England institution for 50 high-grade females over 16 years of age. Supt., Sister Mary Frances. (Class A.)

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Supt., The Sister Superior. (Class A.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—48 males. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—56 males and females. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Broom House School, Broom, Herts.—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

Rowley Lodge, Rowley Green, Barnet.—Educational home for 14 very backward boys and girls. Principal, Miss Wall. (Class A.) See also *Advt.*, p. 76

The Hangers, Porters Park Estate, Shenley. For males. Supt., C. J. Price.

Leavesden Mental Hospital, Abbot's Langley, Watford, Herts.—For 2159 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Med. Supt., R. M. Stewart, M.D.

KENT.

Princess Christian's Farm Colony, Hildenborough.—89 males, 68 females. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.)

Darenth Training Colony, near Dartford, Kent.—For 2260 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Med. Supt., J. K. C. Laing, M.B., B.S.

LANCASHIRE.

Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.—123 female educable children. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington. Supt., Sister A. Pound. (Class A.)

Calderstones, Whalley, near Blackburn.—1152 males, 1534 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (Class A.)

Dovecot Certified Institution, Knotty Ash, Liverpool. For 65 females. Supt., Miss F. Eyre. (Class A.)

Pontrille R.C. Special School, Ormskirk.—121 boys under 16. Mentally defective. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington, 109, Great Mersey Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 80

Scafield House, Waterloo Road, Scaforth, near Liverpool.—101 male, 134 female feeble-minded children. Managers, Public Assistance Committee, Liverpool. (Class B.)

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester (with ancillary premises at *Birstall Holt, Birstall Lane, Leicester*).—120 males, 157 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

LONDON.

South Side Home, Streatham Common, S.W.16. For 80 females (London cases only). Managers, L.C.C. Mental Hospital Committee. Supt., Miss H. G. Hollyer. (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N.—29 females. High-grade mental deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (Class A.)

St. Teresa's, 97, Belmont Hill, Lewisham. For females. Supt., Sister A. Friel. (Class A.)

Fountain Mental Hospital, Tooting Grove, Tooting Graveney, S.W.17. For 670 low-grade unimprovable children (both sexes). Managers, L.C.C. Mental Hospitals Committee. Med. Supt., J. Nicoll, M.D.

MIDDLESEX.

All Souls' Special School, Pield Heath House, Hillingdon.—120 females. Educable and imbeciles. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Bramley House, Clay Hill, Enfield.—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—18 women, 10 children. Hon. Sec. Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. (Class A.)

Normansfield, Teddington.—150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also Advt., p. 79

The Gables, Upper Teddington Road, Hampton Wick.—20 children (both sexes). Manager, Miss Estor Duncan. (Class C.)

Alexander House, 117, High Street, Uxbridge.—24 females over 16. Supt., Miss E. Collyer. (Class D.)

Conifers, Teddington.—22 females, and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

Trematon, Teddington.—24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

The Lodge, Bowthorpe Road, Norwich.—6 adult males, 20 adult females. Managers, The Corporation of Norwich. Supt., F. R. Smith. (Class B.)

NOTTINGHAMSHIRE.

Ranpton State Institution, near Retford.—Both sexes of violent and dangerous propensities. 582 males, 394 females. Med. Supt., W. R. Thomas, M.D. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

SOMERSET.

House of Help (Bath Preventive Mission), 112, Walcot Street, Bath.—66 feeble-minded fallen females. Sec., Miss L. Glynn Baker. (Class A.)

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—263 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 20 females. Supt., Miss L. S. Davison. (Class A.) *See also Advt., p. 79*

Long Ashton Poor Law Institution, Flax Bourton, near Bristol.—32 males, 34 females. Managers, Somerset County Council. (Class B.)

Yatton Hall, Yatton, near Bristol.—Both sexes. Supt., Miss J. McGill. (Class A.)

Sardhill Park, Bishop's Lydeard. For females. Supt., Miss T. Wood.

STAFFORDSHIRE.

New Cross Institution, Mental Wards, Wolverhampton.—7 males, 3 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

Sedgley Poor Law Institution, Burton House, Dudley, Stafford.—50 males, 65 females. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.)

Stallington Hall, Blythe Bridge, Stoke-on-Trent. 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

STIRLINGSHIRE.

The Royal Scottish National Institution, Larbert. For 560 pupils of both sexes and all grades. Res. Med. Supt., R. D. Clarkson, M.D., F.R.C.P. Edin. (Classes A and C.) *See also Advt., p. 78*

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

St. Joseph's Home, The Croft, Sudbury.—27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

SURREY.

Eagle House, London Road, Mitcham. For females. Supt., Miss M. Blandford. (Class A.)

Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate. For both sexes. Supt., Miss E. M. Cooke.

Farmfield, Horley.—133 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Supt., A. J. Oldfield. (Class A.)

Royal Earlswood Institution, Redhill.—350 males, 180 females. Med. Supt., Dr. S. Langton. Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.)

See also Advt., p. 79

The Manor, Epsom.—608 males, 663 females. (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., Dr. E. S. Litteljohn. (Class A.)

Claydon Mental Hospital, Surrey.—For 2008 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Med. Supt., T. Lindsay, M.D., F.R.C.S.

SUSSEX.

The Hermitage Training Home, Fairwarp, near Uckfield. For females. Supt., Miss M. Walton. (Class A.)

Tubrell Farm, Jarcis Brook, near Crowborough. For males only. Supts., Mr. and Mrs. A. Spicer.

WARWICK.

Agatha Stacey Home, Rednal, near Birmingham.—40 females. The Managers, 158, Broad St., Birmingham. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—180 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.)

Warwick State Institution, The Cape, Warwick.—Females only. Supt., Mrs. G. E. Newsome. (Class A.)

WILTS.

Devizes Poor Law Institution.—16 females, 32 males. Managers, Devizes Area Guardians Committee. (Class B.)

Poor Law Institution, Semington, near Trowbridge. 12 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Besford Court Catholic Mental Welfare Hospital for Children, Besford, near Defford.—For 200 seniors, 120 juniors. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

The Kepstorn Institution, Kirkstall, Leeds.—40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

Meanwood Park Colony, Meanwood, Leeds. 139 males, 110 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

Mid-Yorkshire Institution, Whixley, York.—200 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

*NOTE—Ecclesfield, Ashford, is a Roman Catholic Religious Institution.

MALES ONLY.

Nuneaton (Warw.).—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles. See also Advt., p. 81

Rickmansworth (Herts.).—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, Joint G.C. & Metropolitan Rly., ½ mile; L.M. & S.R., 1 mile. See also Advt., p. 82

FEMALES ONLY.

Ashford (Middlesex).*—*Ecclesfield.* Med. Supt., Dr. J. Scott. Apply, Mother Superior. Ashford station, 1 mile.

Belfast.—*The Lodge Retreat, Irwin Avenue.* Med. Attend., R. W. Leslie, M.D. Matron, Miss R. Clarke. Co. Down line train, 2 minutes' walk; G.N. by tram, 20 minutes.

Beverley (E. Yorks.).—*Albion House.* Med. Supt., H. L. Munro, M.D. Hon. Sec., Mrs. T. R. Pentith, Restholme, Sutton, near Hull. Beverley, 1 mile.

Thorpe, near Chertsey.—*Spelthorne St. Mary.* Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale. Virginia Water, 1½ miles.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium Ltd.,* The Mansion, Beckenham Park. Beckenham Junction, 10 minutes. See also Advt., p. 82

Chislehurst (Kent).—*Old Hill House Ltd.* Res. Med. Supt., Walter E. Masters, M.D., M.R.C.S., D.P.H., Barrister-at-law. Tel.: Chislehurst 451. Chislehurst station, 4 minutes. See also Advt., p. 81

Paignton (Devon).—*Bay Mount,* small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

Woodbridge (Suffolk).—*Norwood Sanatorium Ltd.,* Rendlesham Hall, Woodbridge. Wickham Market station. See also Advt., p. 82

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium, Invergarry.* Med. Supt., J. Kirton, M.C., M.A., M.D. Aberchalder, 2 miles.

Ascot.—*Farmwood Sanatorium* (for both sexes). Res. Med. Supt., Dr. H. O. Blanford. Apply, Secretary. Ascot, 1 mile. *See also Advt., p. 84*

Ashford (Kent).—*Grosvenor Sanatorium*, Kennington, near Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Aysgarth (Yorks).—*Wensleydale Sanatorium.* Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R. *See also Advt., p. 88*

Baguley (Cheshire).—*Baguley Sanatorium.* For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, $1\frac{1}{2}$ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne Sanatorium.* Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

Bingley (Yorks).—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham.—*City Sanatorium*, Yardley Road, Smallheath. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R. *Romsley Hill Sanatorium*, Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen, $4\frac{1}{2}$ miles.

Bolton (Lancs).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. W. Rolland. Bolton, 2 miles.

Boston (Lines).—*Holland Sanatorium.* Med. Supt., H. C. Jennings, M.B., D.P.H. Boston, 1 mile.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, $1\frac{1}{2}$ miles; Bournemouth West, $\frac{1}{2}$ mile.

The Firs Home (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

Bovey Tracey (Devon).—*Devon County Sanatorium*, Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

Bradford.—*Bierley Hall Sanatorium*, Bierley Lane. For 60 men and women. Res. Med. Supt., Dr. L. G. White. Bradford, 3 miles.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Treas., Lord Maclay, 21, Bothwell Street. Glasgow. Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Town Hall, Brighton. Brighton Central station, $1\frac{1}{2}$ miles.

Bristol.—*Frenchay Park Sanatorium for Bristol Children*, Frenchay, near Bristol. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S.R., $1\frac{1}{2}$ miles.

Buttevant (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Camberley (Surrey).—*Prior Place Sanatorium*, Heatherside. Res. Med. Supt., Dr. H. O. Blanford. *See also Advt., p. 86*

Camborne (Cornwall).—*Tehidy Sanatorium.* Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

Cambridge.—*Papworth Village Settlement.* Med. Director, P. C. Varrier-Jones, M.A., M.R.C.S., M.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

Chagford (Devon).—*Dartmoor Sanatorium.* Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

Chandler's Ford (Hants).—*Hants County Council Sanatorium.* Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Cheltenham.—*The Cotswold Sanatorium*, Cranham, Gloucester. Res. Med. Phys., A. H. Hoffman, M.D., Geoffrey A. Hoffman, M.B., and Margaret A. Harrison, M.B., B.S. Cheltenham, 8 miles.

See also Advt., p. 84

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Conway, North Wales.—*The Dr. Garrett Memorial Home*, Morfa Drive. For boys and girls. 200 beds (86 open-air). Proprietress, C. E. M. Garrett.

See also *Advt.*, p. xlviii

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Davos-Platz (Switzerland).—*Sanatorium Schatzalp*. Res. Med. Supt., Edward C. Neumann, M.D. Davos-Platz station and Schatzalp funicular.

See also *Advt.*, p. 89

Park Sanatorium (formerly *Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 91

Victoria Sanatorium, Davos (Grisons). Res. Med. Supt., Bernard Hudson, M.D., M.R.C.P.

See also *Advt.*, p. 91

Derbyshire.—*Derbyshire County Sanatorium*, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, $1\frac{1}{2}$ miles.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

Dublin.—*Peamont Sanatorium*, New-castle, Co. Dublin. Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

Dundee (near).—*Sidlaw Sanatorium*, Auchterhouse. 80 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Sec., Geo. B. Brough. Auchterhouse station, $1\frac{1}{2}$ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men and boys: Stanhope. Stanhope station, 1 mile. For women and children: Wolsingham. Wolsingham station, $\frac{1}{2}$ mile.

East Fortune (East Lothian).—*East Fortune Sanatorium*. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, $\frac{1}{2}$ mile.

Ecclefechan, by Lockerbie.—*St. Fechan's Sanatorium*, for boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Sec., J. Osborne, 99–103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

Grange-over-Sands.—*Westmorland Sanatorium*, Meathop. Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

Harpenden (Herts).—*Sanatorium of the National Children's Home and Orphanage*. Harpenden station, L.M. & S. R. Vis. Phys., T. N. Kelynack, M.D., J.P. Principal, Rev. W. Hodson Smith, Highbury Park, London, N.5. See also *Advt.*, p. 85

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Offs., Dr. N. F. Stallard and Dr. C. de W. Kitcat. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*Cleaver Sanatorium for Children*. 200 beds. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, $1\frac{1}{2}$ miles.

Hexham (Northumberland).—*Wooley Sanatorium*. Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

Hull.—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, 87, Victoria Avenue, Hull. Med. Off., Dr. S. F. Fouracre. Withernsea station.

Huntingdon.—*Wyton Sanatorium* (Hunts County Council), for women and children. Res. Med. Off., Dr. J. H. Jones. Huntingdon, $3\frac{1}{2}$ miles.

Ilkley (Yorks).—*Middleton Sanatorium*, near Ilkley. Res. Med. Supt., T. Campbell, M.D. Ben Rhydding, $1\frac{1}{2}$ miles.

Isle of Wight.—*Hermitage Sanatorium*, Whitwell, near Ventnor. For males only. Apply, Medical Superintendent.

Royal National Hospital for Consumption, Ventnor. Med. Supt., Dr. G. Oliver Hempson. Sec., W. H. Garrett, 18, Buckingham St., Strand, W.C. Ventnor, 1 mile. See also *Advt.*, p. 63

Kingussie (Inverness-shire).—*Grampian Sanatorium*. Res. Med. Supt., Felix Savy, M.D. Kingussie, $\frac{1}{2}$ mile.

See also *Advt.*, p. 87

Kirkcaldy—*Sanatorium for Tuberculosis*. Med. Supt., Dr. G. W. McIntosh. Res. Med. Off., Dr. S. K. Drainer. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Leeds.—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby. Res. Med. Supt., Dr. H. E. Reburn. *Leeds Sanatorium for Consumptives*, Killingbeck; and *Children's Sanatorium*, "The Hollies," Westwood, Leeds.

Leysin-Feydey (Switzerland).—*Station Climatique de Leysin*: Sanatorium Grand Hotel (Dr. Jaquerod), Sanatorium Mont-Blanc (Dr. Piguet), Sanatorium Chamossaire (Dr. Sillig and Dr. Jeanneret), Sanatorium Belvédère (Dr. Gilbert). Leysin-Feydey station, from 1 to 5 minutes. *See also Advt., p. 91*

Liverpool.—*Broadgreen Sanatorium*, Edge Lane Drive, Liverpool. Res. Med. Supt., H. R. Macintyre, D.S.O., M.C., M.D., D.P.H. Broadgreen station, $\frac{1}{2}$ mile.

Fazakerley Sanatorium, Longmoor Lane, Liverpool. Res. Med. Supt., C. Rundle, O.B.E., M.D. Fazakerley station, $\frac{1}{2}$ mile.

Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L.M. & S.R.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium*. The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of the Heart and Lungs*, Victoria Park, E.2. Apply, Secretary. Cambridge Heath station, 5 minutes by bus or tram. *Royal Chest Hospital*, 231, City Road, E.C.1 (Section of the Royal Northern Group of Hospitals). Apply to the Sec.

Manchester.—*Manchester Hospital for Consumption and Diseases of Throat and Chest*, Hardman Street, Deansgate, Manchester (Out-patients). Sec., C. W. Hunt. Bowdon, Cheshire (In-patients); *Crossley Sanatorium*, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.)

Market Drayton (Shropshire).—*Cheshire Joint Sanatorium*. Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, $\frac{1}{2}$ miles.

Marple (Cheshire).—*Nab Top Sanatorium*, for residents of Salford only. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, $\frac{1}{2}$ mile.

Menai Bridge, Anglesey.—*Penhesgyn-y-Gors Sanatorium* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. Emrys Jones. Matron, S. J. Bennett. Menai Bridge, 3 miles.

Mendip Hills.—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Med. Supt., R. Thurman, M.D. Burrington station, G.W.R., 4 miles. *See also Advt., p. 86*

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., Dr. R. R. Trail. Midhurst, 4 miles.

Montana-sur-Sierre (Switzerland).—*Montana Hall*. Res. Med. Supt., Hilary Roche, M.D., M.R.C.P.

See also Advt., p. 83

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium*. Res. Med. Supt., Dr. J. M. Johnston. Murtle, $\frac{1}{2}$ mile.

See also Advt., p. 89

Nayland (Suffolk).—*East Anglian Sanatorium* for private patients, *Maltings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium*, Nayland. Med. Supt., Dr. Jane Walker. Bures Station, L. & N.E.R., $3\frac{1}{2}$ miles; Colchester, 8 miles.

See also Advt., p. 88

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Nîmes (Gard), France.—*Sanatorium du Mont-Duplan*. Medical Director, Dr. Louis Baillet. Nîmes station, 20 minutes.

See also Advt., p. 90

Norfolk.—*Children's Sanatorium for the Treatment of Phthisis*, Incorporated, Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

Kelling Sanatorium, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, $1\frac{1}{2}$ miles.

Mundesley Sanatorium, Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., L. W. Sharp, M.B., and Andrew J. Morland, M.D. Mundesley, 1 mile.

See also Advt., p. 86

Northampton.—*Creaton Sanatorium*, Creaton. Res. Med. Supt., Dr. H. Selby. Brixworth, L.M. & S.R., 3 miles.

Nottinghamshire.—*Ransom Sanatorium* (Notts County Council), Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

Oban (Scotland).—*Argyll County Sanatorium*, Benvoulin. 40 beds. Vis. Med. Off., Duncan MacDonald, M.D. Matron, Miss M. A. Macdonald. Oban, 1 mile.

Oldham.—*Strinesdale Sanatorium*. Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

Peebles.—*Manor Valley Sanatorium*. Med. Off., C. B. Gunn, M.D. Peebles, 4 miles; Lyne, $\frac{1}{2}$ miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium*. Res. Phys., Dennison Pickering, M.D. (Camb.), and J. L. Faull, M.R.C.S., L.R.C.P. Penmaenmawr, L.M. & S.R., $1\frac{1}{2}$ miles.

See also Advt., p. 87

Peppard Common (Oxon).—*Berks and Bucks Joint Sanatorium*. Res. Med. Off., Dr. Esther Carling. Reading, $6\frac{1}{2}$ miles.

Ringwood (Hants).—*Linford Sanatorium*. Res. Med. Supts., A. de W. Snowden, M.D., Dr. A. G. E. Wilcock, and Dr. C. Cassidy. Ringwood, 3 miles.

Robertsbridge (Sussex).—*Darrell Hall Sanatorium* (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. Rly., $\frac{1}{2}$ mile.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium*. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. See also *Advt.*, p. 83

St. Leonards.—*Eversfield Chest Hospital*. West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.R.; West Marina, S.R. within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merville Sanatorium*. Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R., $3\frac{1}{2}$ miles.

Sandy (Beds).—*The Bedfordshire County Sanatorium*, Mogerhanger Park. Med. Supt., C. G. Welch, M.D.

Sheffield.—*The City Sanatoria*. Crimicar Lane Sanatorium (males); Commonsides Sanatorium (females); Winter Street Sanatorium (both sexes); Nether Edge Sanatorium (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R., $4\frac{1}{2}$ miles.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium for Boys*. Res. Med. Off., Dr. Whitehead. Embsay station, 2 miles.

Stannington (Northumberland).—*Children's Sanatorium*. Res. Med. Off., Dr. Elsie F. Farquharson. Med. Supt., T. C. Hunter, M.D. Surgeon, H. M. Johnston, F.R.C.S. Matron, Miss I. Campbell. Stannington station, 2 miles.

Stonehouse (Glos).—*Standish House Sanatorium*. Res. Med. Supt., W. A. Dickson, M.D., F.R.C.S. Stonehouse, G.W.R., $1\frac{1}{2}$ miles; L.M. & S.R., $2\frac{1}{2}$ miles.

Stourbridge (Wores).—*Prestwood Sanatorium*. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Swansea.—*Adelina Patti Tuberculosis Hospital*, "Craig-y-nos," Pen-y-cae. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 miles. See also *Advt.*, p. 89

Torquay.—*"Whitecliff" Tuberculosis Hospital*. Med. Supt., Dr. R. H. Robinson. Tuberculosis Off., Dr. E. Ward. Torre station, 2 miles.

Ulverston.—*High Carley Sanatorium* (including *Oubas House Children's Sanatorium*). Res. Med. Supt., E. H. A. Pask, M.D. Ulverston, 2 miles.

Vence (Alpes Maritimes), France.—*Sanatorium La Maison Blanche*. Med. Directors, Drs. Bailva and Benoist. See also *Advt.*, p. 90

Ware (Herts).—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary.

Whiteabbey (Co. Antrim).—*Belfast Municipal Sanatorium*. Res. Med. Supt., P. S. Walker, M.D., B.Ch., D.P.H.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Res. Med. Off., Dr. J. D. Macfie. Limpley Stoke station, 1 mile.

Worcester (near).—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, $1\frac{1}{2}$ miles.

HYDROPATHIC ESTABLISHMENTS.

Bournemouth (Hampshire).—*Bournemouth Hydropathic*. Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station, $\frac{1}{2}$ mile.

Durley Dean Hydro, Bournemouth. Proprietor, C. K. Harper. Bournemouth West, 1 mile.

Linden Hall Hydro, Bournemouth. Proprietors, The Exton Hotels Co. Ltd.

Bristol.—*The Bristol Hydropathic and Electrotherapeutic Establishment*, College Green. Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S. Temple Meads, $1\frac{1}{2}$ miles.

Buxton.—*Buxton Hydro Hotel*. Manager, G. W. Bosworth. Station, 4 minutes. *Haddon Hall Hydro*, Buxton. Proprietor, G. R. Oliver.

Cork.—*St. Ann's Hill Hydropathic*, St. Ann's Hill, near Blarney, Co. Cork. Res. Phys., Dr. R. H. Barter. Blarney station, 3 miles.

Crieff.—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Forres.—*Cluny Hill Hydropathic*. Vis. Phys., Dr. John C. Adam. Forres station, 1 mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro*. Manageress, Mrs. Baxter. Harrogate station, 1 mile.

The Cairn Hydro, Harrogate. Apply, Manager. Harrogate station, $\frac{3}{4}$ mile.

The Harrogate Hydropathic Lim. Med. Supt., Dr. A. Hinsley-Walker. Man., W. Taylor. Harrogate station, $\frac{1}{2}$ mile.

Ilkley (Yorkshire).—*Craiglands Hydro*. Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). See also Advt., p. 94

Limpley Stoke (near Bath).—*West of England Hydropathic*. Apply, the Secretary. Limpley Stoke station.

Matlock.—*Rockside Hydropathic*, Matlock. Matlock, $\frac{1}{2}$ mile.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus. See also Advt., p. 95

Peebles.—*Peebles Hotel Hydropathic*. Med. Supt., Dr. Thomas Martin. L.M.S. and L. & N.E.R. stations, about 10 to 15 minutes' walk. Bus meets all trains.

See also Advt., p. 93

Southport (Birkdale Park).—*Smedley Hydropathic*. Southport or Birkdale stations, 5 minutes.

Kenworthy's Hydropathic. Southport. Phys., Dr. Irene E. Kenworthy. Chapel Street (L.M. & S.); Lord Street (Cheshire Lines); 3 minutes by taxicab.

West Kirby (Cheshire).—*West Kirby Hydro Hotel*. Telephone: Hoylake 86. Kirby Park station, 5 minutes. Apply Manageress. See also Advt., p. 94

NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

London.—*Cavendish Temperance Male Nurses' Corporation Lim.*, 54, Beaumont St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 170, Oxford Rd., Manchester.

See also Advt., p. 76

Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. See also Advt., p. 73

New Mental Nurses' Co-operation, 139, Edgware Road, Marble Arch, W.2.

See also Advt., p. 72

Norfolk Square Nursing Association and Hyde Park Association of Trained Nurses, 49, Norfolk Square, W.2. Lady Supt., Miss J. S. Weir. See also Advt., p. 77

The Nurses' Association, 29 York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 73

York.—*The Retreat, Trained Nurses' Department*. Apply to the Matron.

See also Advt., p. 77

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles.

See also Advt., p. 80

Bath.—*Lansdown Hospital and Nursing Home*, Bath. Special arrangements for patients suffering from gout, rheumatism, and physical infirmities. Physician, Dr. Wells-Beville. L.M. & S. or G.W. stations. 1 mile. See also Advt., p. 72

Bristol.—*Dorset House*, Clifton Down. Functional nervous disorder—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M. See also Advt., p. xlv

Broadstone, Dorset.—*"Rizwan" Nursing Home*, Blandford Road. For T.B. patients. Apply Sister Challis.

See also Advt., p. 84

Caterham (Surrey).—*Cedar Grange*. For electrotherapy, radiation therapy, massage, etc. Res. Med. Supt., D. L. Greig, M.R.C.S., L.R.C.P., D.M.R.E.

See also Advt., p. 75

Ewell, near Epsom.—*Ewell Grove Nursing Home.* Nervous and other cases. Res. Med. Supt., J. G. Garson, M.D. Apply, Mrs. Garson. *See also Advt., p. 74*

Great Missenden (Bucks).—*Woodlands Park.* Rest after operation or illness, cardiac and nervous diseases, or permanent invalids. Res. Phys., C. W. J. Brasher, M.D. Great Missenden, $1\frac{1}{2}$ miles. *See also Advt., p. 81*

Harrow-on-the-Hill.—*Bowden House* (for functional nervous disorders). Med. Supt., E. Graham Howe, M.B., B.S., D.P.M. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk. *See also Advt., p. 74*

Hatch End (Middlesex).—*Oxhey Grove.* For borderline cases of both sexes. Res. Med. Supt., Dr. Josephine A. Miller. Hatch End station, 1 mile. *See also Advt., p. 74*

King's Langley (Herts).—*The Archer Nerve Training Colony, Langley Rise, Ltd.* (for functional nervous disorders). Apply Secretary. *See also Advt., p. 76*

Liverpool.—*Home for Epileptics, Maghull* (for sane epileptics), and *Chilton Home*, certified as a special school for 82 epileptic

children. Med. Officer, C. V. H. Nesbit, M.D. Hon. Sec., C. E. Grisewood, A.C.A., 2, Exchange Street East, Liverpool. *See also Advt., p. 76*

London.—*Minerva House*, 12 & 14, Comeragh Road, West Kensington, W.14. Medical, Surgical, Maternity, and Nerve cases. Apply, Miss Purdy. District Rly. station, 3 mins. walk. *See also Advt., p. xiv*

The Radium Institute, 16, Riding House Street, W. Sec., Thomas A. Garner, F.C.I.S. *See also Advt., p. 69*

Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist. Met. and Piccadilly Tube), 2 minutes. 'Phone, West 1010. *See also Advt., p. 77*

Woodside Nerve Hospital, Woodside Avenue, Muswell Hill, N.10. (St. Luke's Foundation). For functional nervous disorders. Physician in charge. *See also Advt., p. 74*

Ruthin, North Wales.—*Ruthin Castle.* Private Hospital for Internal Diseases. Senior Physician, E. I. Spriggs, M.D., F.R.C.P. Ruthin, $\frac{1}{2}$ mile. *See also Advt., p. L*

PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Climate mild and equable.

Waters.—The only hot springs in Britain, varying from 104° to 120° , and the richest natural radio-active mineral waters in this country.

Therapeutic Indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions.

Baths.—An extensive and thoroughly equipped bathing establishment; including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Flonbières douches), throat sprays and inhalation of the natural radium emanation.

Hotel.—The Pulteney Hotel (*see p. 96*).

Nursing and Baths.—Lansdown Hospital and Nursing Home (*see p. 72*).

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 35 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic Indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Buxton (Derbyshire).—1000 to 1200 feet above sea level; 163 miles from London; 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate spring.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria mucocombranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized.

Hotel.—The Old Hall Hotel (*see p. 94*).

Cheltenham (Gloucestershire).—184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 26 inches. Sunshine 1484 hours.

Waters.—Of four kinds: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; the Pittville or alkaline saline; and the Chadrod or magnesium and calcium saline.

Therapeutic Indications.—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

Baths.—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa.

Droitwich Spa (Worcestershire).—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 29 inches. Mean maximum temperature 60° F., mean minimum temperature 40° F.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

Therapeutic Indications.—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotels.—Park Hotel (*see p. 98*); Raven Hotel (*see p. 98*); Worcestershire Brine Baths Hotel (*see p. 99*).

Boarding Establishment.—Ayrshire House (*see p. 99*).

Harrogate (Yorkshire).—450–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 46° F.

Waters.—Celebrated for the medicinal properties of its 88 different mineral waters—sulphurous, chalybeate, alkaline, and saline.

Therapeutic Indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anæmia, nervous diseases, hyperpiesis, and the sequelæ of tropical diseases.

Baths.—There are five establishments, where nearly 100 treatments are given.

Mineral Water.—‘Aquaperia’ aperient mineral water is bottled at Harrogate by Camwal Ltd. from their own Spring (*see p. 167*).

Leamington Spa (Warwickshire).—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 24.59 inches. Mean annual temperature 49°. Westerly winds prevail.

Waters.—Radio-active saline springs, resembling those of Homburg.

Therapeutic Indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, eczema, and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, saline, Plombières, paraffin wax, Berthollet, and electric.

Llandrindod Wells (Radnorshire).—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London by road.

Waters.—Saline, sulphur and radium-sulphur, magnesium, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic Indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

Baths.—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

Hotel.—Ye Wells Hotel (*see p. 96*).

Strathpeffer Spa (Ross-shire, N.E.).—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic Indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

Therapeutic Indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

Woodhall Spa (Lincolnshire).—50 feet above sea level. 124 miles from London. Average rainfall 22½ inches.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic Indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Spa Baths.—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

New Zealand Spas.—Many of the mineral waters of New Zealand are quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than most Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of *sulphur waters* of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, used for baths only.

Climate and Season.—The spa being 1000 ft. up, the climate is by no means hot. Season from December to May, but baths open all the year round.

TARPO.—The most elevated spa in New Zealand.

Climate.—Tonic and sedative. The waters are hot salines, with carbonic acid gas; also alkaline and chalybeate.

TE AROHA.—Hot *alkaline waters* of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative.

HANMER.—In the South Island; has mild sulphur baths and a bracing climate.

OTHER BRITISH SPAS.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic Indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 48° F. Bracing and invigorating moorland air.

Waters.—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

Therapeutic Indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (*see p. 94*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic Indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—520 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 28 inches. Mean temperature about 49° F. Exceptional sunshine records.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump Room adjoining the Winter Gardens and Priory Park.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Treatments.—Medical baths are in course of provision and will shortly be available for all modern treatments.

Matlock Bath (Derbyshire).—300 to 800 feet above sea level, 143 miles from London. Average rainfall 36 inches. Mean temperature about 47° F. Very sheltered.

Waters.—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

Therapeutic Indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Matlock Bank (Matlock station, one mile by rail from Matlock Bath).—South-westerly aspect, and well sheltered from the north. 144 miles from London. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant heat and light, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

Hydropathic Establishment.—Smedley's Hydropathic (see p. 95).

Peebles (Peeblesshire, N.B.).—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic Indications.—The waters are specially suited to the Nauheim and Bourboncancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydro (see p. 93).

Torquay (Devonshire).—199½ miles from London. Non-stop express trains run daily, the journey occupying only 3½ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. Average rainfall, 40 inches. Mean temperature, 51°. Sunshine record averages 1784 hours. Ultra-violet rays 1929, 5.8.

Climate.—Mild, soft, and equable. It is specially beneficial for many pulmonary, bronchial, and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. The season is all the year round.

Baths.—The medical baths are very modern and complete. They are ideally situated. All British and Continental spa treatments are available. A trained and skilled staff is always in attendance. Medical consultation rooms have been opened for the convenience of medical practitioners and patients. There is a large tepid sea-water swimming bath. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout. (See also p. xlviii.)

Hotel.—Palm Court Hotel (see p. 97).

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 30 inches. Mean temperature, 49°.

Waters.—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic Indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

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 Radiology, British Journal of—Monthly 4/-; 42/- per annum—Wm. Heinemann Ltd.,
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 St. Thomas's Hospital Gazette—Six times a year, 7/6—St. Thomas's Hospital, S.E.1.
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 South Africa, Journal of the Medical Association of—Fortnightly 1/3; 31/6 per annum
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 State Medicine, Journal of—Monthly 2/-—37, Russell Square, W.C.1.
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 Titchfield Street, W.1.
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 Orange Street, W.C.2. (See Advertisement.)
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1931

| JANUARY. | |
|----------|--------------|
| S | * 411 18 25 |
| M | * 512 19 26 |
| Tu | * 613 20 27 |
| W | * 714 21 28 |
| Th | 1 815 22 29 |
| F | 2 916 23 30 |
| S | 3 1017 24 31 |

NOTES.

Copy here any formula or fact you wish
to keep for reference.

1931

| FEBRUARY. | |
|-----------|-------------|
| S | * 1 815 22 |
| M | * 2 916 23 |
| Tu | * 3 1017 24 |
| W | * 4 1118 25 |
| Th | * 5 1219 26 |
| F | * 6 1320 27 |
| S | * 7 1421 28 |

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1931

| MARCH. | |
|--------|---------------|
| S | 1 15 22 29 |
| M | 2 9 16 23 30 |
| Tu | 3 10 17 24 31 |
| W | 4 11 18 25 |
| Th | 5 12 19 26 |
| F | 6 13 20 27 |
| S | 7 14 21 28 |

NOTES.

1931

| APRIL. | |
|--------|--------------|
| S | * 5 12 19 26 |
| M | * 6 13 20 27 |
| Tu | * 7 14 21 28 |
| W | 1 8 15 22 29 |
| Th | 2 9 16 23 30 |
| F | 3 10 17 24 * |
| S | 4 11 18 25 * |

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| MAY. | |
|------|-----------------|
| 5 | * 8 10 17 24 31 |
| M | * 4 11 18 25 * |
| Tu | * 5 12 19 26 * |
| W | * 6 13 20 27 * |
| Th | * 7 14 21 28 * |
| F | 18 15 22 29 * |
| S | 29 16 23 30 * |

NOTES.

1931

| JUNE. | |
|-------|----------------|
| 5 | * 7 14 21 28 * |
| M | 1 * 15 22 29 |
| Tu | 2 9 16 23 30 |
| W | 3 10 17 24 * |
| Th | 4 11 18 25 * |
| F | 5 12 19 26 * |
| S | 6 13 20 27 * |

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1931

| JULY. | |
|-------|---------------|
| W | * 5 12 1 2h |
| M | * 6 13 20 27 |
| Tu | * 7 14 21 28 |
| W | 1 8 15 22 29 |
| Th | 2 9 16 23 30 |
| F | 5 10 17 24 31 |
| S | 4 11 18 25 * |

NOTES.

1931

| AUGUST. | |
|---------|-----------------|
| S | * 1 8 15 22 30 |
| M | * 5 10 17 24 31 |
| Tu | * 4 11 18 25 * |
| W | * 5 12 19 26 * |
| Th | * 6 13 20 27 * |
| F | * 7 14 21 28 * |
| S | 1 8 15 22 29 * |

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| SEPTEMBER. | |
|------------|--------------|
| S | * 6 13 20 27 |
| M | * 7 14 21 28 |
| Tu | 1 8 15 22 29 |
| W | 2 9 16 23 30 |
| Th | 3 10 17 24 * |
| F | 4 11 18 25 * |
| S | 5 12 19 26 * |

ADDRESSES (PRIVATE).

1931

| OCTOBER. | |
|----------|---------------|
| S | * 4 11 18 25 |
| M | * 5 12 19 26 |
| Tu | * 6 13 20 27 |
| W | * 7 14 21 28 |
| Th | 1 8 15 22 29 |
| F | 2 9 16 23 30 |
| S | 3 10 17 24 31 |

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1931

| NOVEMBER. | |
|-----------|--------------|
| S | 1 8 15 22 29 |
| M | 2 9 16 23 30 |
| Tu | 3 10 17 24 * |
| W | 4 11 18 25 * |
| Th | 5 12 19 26 * |
| F | 6 13 20 27 * |
| S | 7 14 21 28 * |

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1931

| DECEMBER. | |
|-----------|---------------|
| S | * 6 13 20 27 |
| M | * 7 14 21 28 |
| Tu | 1 8 15 22 29 |
| W | 2 9 16 23 30 |
| Th | 3 10 17 24 31 |
| F | 4 11 18 25 * |
| S | 5 12 19 26 * |

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Classified Index to Advertisements.

(For Alphabetical Index, see page 7.)

| | PAGE | | PAGE |
|--|------------------------|---|--------------|
| ACCOUNTS, MEDICAL— | | Bayer Products Ltd. | xxxvi-xxxvii |
| Cabinets, Roll Top.. (H. K. Lewis) | 26 | Bengue & Co. Ltd. | 163 |
| "Card Index" Account System (Wright) | 13 | Bircon Laboratories | xlii |
| Medical Collector's Books and Cards | | British Colloids Ltd. | xxxix |
| (Wright) | 6 | British Organotherapy Co. Ltd. | xlvii |
| Physicians' and Surgeons' Register | | Briton Ferry Chemical & Manure Co. Ltd. | 149 |
| (Wright) | 5 | Burroughs Wellcome & Co. | 153 |
| Visiting Lists (Wright) | 17 | Clay & Abraham Ltd. | lii |
| ANATOMICAL MODELS— | | Clayton Aniline Co. Ltd. | xxxviii |
| Philip, Geo. & Son Ltd. | 6 | Collis Browne's Chloro-lyne | lviii |
| ARTIFICIAL LIMBS, EYES, Etc.— | | Crookes Laboratories | xxxix |
| Critchley, J. & Sons | 136 | Denver Chemical Mfg. Co. | xxxv |
| Desoutter Bros. Ltd. | lii | Duncan, Flockhart & Co. | xxxviii |
| Grossmith, W. R. Ltd. | 142 | Edme Ltd. | xlii |
| Hanger, J. E. & Co. Ltd. | xxv | English Grains Co. Ltd. | 162 |
| Haywood, J. H. Ltd. | 136 | Ferris & Co. Ltd. Back End Papers and | 158 |
| Hill, W. & Co. | 134 | Giles, Schacht & Co. | ix, 599 |
| Masters, M. & Sons Ltd. | xviii | Heinemann's Calf Lymph | 165 |
| Pache & Son (Eyes) | 147 | Hewlett, C. J. & Son Ltd. | 160 |
| Pearce, Allen | 150 | Hormones & Chalcones Ltd. | 164 |
| Weiss, John & Son Ltd. | 142 | Jenner Institute for Calf Lymph | 165 |
| Wilson, W. J. & Co. Ltd. | liii | Kaylene Ltd. | xxxviii |
| Woolley, Jas. Sons & Co. Ltd. | 144 | Lycoc Yeast Tablet Co. Ltd. | 162 |
| ASSURANCE, LIFE, ADVICE | | Macfarlan, J. F. & Co. | xxxv |
| CONCERNING— | | Martindale, W. | 163 |
| Tidswell, Ernest, M.A., F.P.I. | 20 | May, Roberts & Co. Ltd. | 166 |
| ASSURANCE OFFICES, Etc.— | | Modern Pharmacies Ltd. | 167 |
| Britannic Assurance Co. Ltd. | 14 | Napp, H. R. Ltd. | 169 |
| Norwich Union Life Insurance Society | 14 | Norwegian Medicinal Cod Liver Oil | lvii |
| Tidswell, Ernest, M.A., F.P.I. Life Assur- | | Paines & Byrne Ltd. | xxxix |
| ance Consultant | 20 | Parke, Davis & Co. | xxxix |
| Wesleyan and General Assurance Society | 17 | Petrolagar Laboratories Ltd. | 166 |
| Yorkshire Insurance Co. Ltd. | 21 | Proselids Chemical Co. | 161 |
| BEDS (HOSPITAL)— | | Reliance Lubricating Oil Co. Ltd., Dish- | |
| Hoskins & Sewell Ltd. | lv | fectants | 149 |
| BOOK ANNOUNCEMENTS—(see page 10) | | Reynolds & Branson Ltd. | xiv, xv |
| BOOKSELLERS (MEDICAL)— | | Rigollot's Mustard Leaves | xxxviii |
| Bryce, Wm. | 24 | Robertson, John & Co. | 161 |
| Foyle, W. & G. Ltd. | xliv | Saccharin Corporation Ltd., Amesthetics, | |
| H.M. Stationery Office | 35 | etc. | xxxi |
| Lewis, H. K. & Co. Ltd. | xliii, xlv, 26, 32, 33 | St. Amand Manufacturing Co. | 167 |
| Tidin, James | xlv | Salamon & Co. Ltd. | 166 |
| BOOT & SHOE MAKERS— | | Schering Ltd. | ii, 596, 597 |
| Dowie & Marshall Ltd. | 145 | Scott & Bowne Ltd. | 151 |
| BOTTLES AND VIALS— | | S.P. Charges Co., Sulphagua | 166 |
| Beatson, Clark & Co. Ltd. | 145 | Stevens, S. & Co. | 164 |
| Isaacs, I. & Co. | 146 | Sumner, R. & Co. Ltd. Front Cover, and iv-vii | |
| BRANDIES, WINES, SPIRITS, Etc.— | | Tamar Indian Grillon | xxxviii |
| Brown, Gore & Welch Ltd., Brandy | xi | Thomson, R. | xli |
| Friony, Rogée & Co., Brandy | 162 | Willows, Francis, Butler & Thompson Ltd. | 160 |
| Gautier Freres' Brandy | xi | DENTAL APPLIANCES— | |
| Portal, Digwall & Norris, Lemon Hart Rum | xlii | Dental Manufacturing Co. Ltd. | 142 |
| Rattray, A. Dewar, Whiskies | lvi | Sudderick & Co. | 137 |
| BUILDINGS (PORTABLE, Etc.— | | EDUCATIONAL INSTITUTIONS, | |
| Hobson, J. T. & Co. (Revolving Shelters) | 148 | SCHOOLS, TUTORS, Etc.— | |
| Strawson, G. F. (Open-Air Shelters) | 148 | Barnardo's (Dr.) Homes | lii, 640 |
| CHEMICAL PREPARATIONS, | | Cranemoor School, Highcliffe-on-Sea | xli |
| DISINFECTANTS, Etc.— | | David Lewis (Clony for Epilepsy, Warford | 80 |
| Allen & Hanburys Ltd. | 154, 155 | Educational Institute of Scotland | 86 |
| Alliance Drug & Chemical Co. | 152 | Fellowship of Medicine and Post-Graduate | |
| Anglo-French Drug Co. Ltd. | xxx | Medical Association | 66 |
| | | Kensington College | 66 |
| | | Lyncombe Hall School, Bath | 67 |
| | | Manchester Tutorial College | 66 |
| | | Miall, Eric J., A.L.C.M. (Stammering) | 68 |
| | | Moore, Joseph (Stammering) | 68 |
| | | National Children's Home and Orphanage | 85 |

| | PAGE | | PAGE |
|---|----------|--|------|
| EDUCATIONAL INSTITUTIONS—continued. | | | |
| Normansfield, Teddington (Mentally Deficient) | 79 | Royal Albert Institution, Lancaster (Feeble-minded Children) | 80 |
| Rock Hall House, Combe Down, Bath (Mentally Defective Children) | 79 | Royal Earlswood Institution, Redhill (Mental Defectives) | 79 |
| Rowley Lodge, High Barnet (Backward Children) | 76 | Royal Scottish National Institution, Larbert (Mentally Deficient Children) | 78 |
| Royal Albert Institution, Lancaster (Feeble-minded Children) | 80 | Ruthin Castle, North Wales (Hospital for Internal Diseases) | 1 |
| Royal Earlswood Institution, Redhill (Mental Defectives) | 79 | Stoke Park Colony, Stapleton, Bristol (Mentally Defective Children) | 80 |
| Royal Scottish National Institution, Larbert (Mentally Defective Children) | 78 | Woodlands Park, Gt. Missenden, Bucks | 81 |
| Schnelle, A. C. (Stammering) | 68 | HOSPITAL EQUIPMENT— | |
| Stoke Park Colony, Bristol (Mentally Defective Children) | 80 | Hoskins & Sewell Ltd. | 1v |
| Taunton School for Boys, Taunton | 56 | HOSPITALS, MEDICAL SCHOOLS— | |
| University Examination Postal Institution Warl, Miss Kingdon (Speech Defects) | 68 | Bethlem Royal Hospital for Nervous Diseases | 101 |
| Wellington School, Somerset | 65 | Educational Institute of Scotland | 66 |
| ELECTRO-MEDICAL APPARATUS— | | | |
| Darlington, G., Scalytic Light | xviii | Fellowship of Medicine and Post-Graduate Medical Association | 66 |
| Dean, A. E. & Co. | x | Gordon Hospital for Rectal Diseases | 56 |
| Dowsing Radiant Heat Co. Ltd. | 69 | Hospital for Epilepsy and Paralysis | 56 |
| Mottershead & Co. | 150 | Hospital for Sick Children | 65 |
| Vivor N-Ray Corporation Ltd. | xi | King's College Hospital Medical School | 57 |
| ENGRAVERS— | | | |
| Swain, John & Son Ltd., Illustrations | 22 | Lansdown Hospital, Bath | 72 |
| FOODS, MILKS, Etc.— | | | |
| Berina Food (Montgomery & Co. Ltd.) | 150 | London Clinic of Psycho-Analysis | 67 |
| Flucher, Fletcher & Co. Ltd. | 163 | London Fever Hospital | 64 |
| Mazawattie Tea Co. Ltd. | 163 | London Foot Hospital | 64 |
| Schweitzer's Cocoa-lina | 163 | London Hospital Medical College | 57 |
| Sumner, R. & Co. Ltd. | vii | London School of Dermatology | 54 |
| Valentine's Meat-Juice Co. Front End Paper | | Manchester Tutorial College | 66 |
| Vitalba Ltd., Meat Juice | 1vi | Maudsley Hospital, London | 55 |
| FUNCTIONAL NERVOUS DISORDERS | | | |
| Archer Nerve Training Colony, King's Langley | 76 | Middlesex Hospital Medical School | 53 |
| Bethlem Royal Hospital | 101 | North-East London Post-Graduate College | 63 |
| Bowden House, Harrow | 71 | Plaistow Hospital, London | 65 |
| Caldecote Hall, Nuneaton | 81 | Prince of Wales's General Hospital | 63 |
| Dorset House, Clifton | xliv | Queen Mary's Hospital for the East End | |
| Maudsley Hospital, London | 55 | Radium Institute, London | 69 |
| Woodside Nerve Hospital, London | 74 | Rollier's (Dr.) Clinics, Leyton | 75 |
| HEALTH RESORTS (see "Hydro-therapeutic Establishments, Spas," etc.) | | | |
| HOMES FOR INVALIDS— | | | |
| Archer Nerve Training Colony, King's Langley | 76 | Rotunda Hospital, Dublin | 62 |
| Barnardo's (Dr.) Homes | lii, 600 | Royal College of Surgeons, Edinburgh | 61 |
| Bowden House, Harrow (Functional Nervous Disorders) | 74 | Royal Dental Hospital of London | 69 |
| Brunton House, Lancaster (Feeble-minded Children) | 80 | Royal London Ophthalmic Hospital | 63 |
| Cedar Grange, Caterham | 75 | Royal National Hospital for Consumption and Diseases of the Chest, Ventnor | 63 |
| David Lewis Colony, Warford (Epileptic Disorders) | 80 | Ruthin Castle, North Wales, Private Hospital for Internal Diseases | 1 |
| Dorset House, Clifton (Functional Nervous Disorders) | xliv | St. John's Skin Hospital, London | 54 |
| Ewell Grove Nursing Home, Ewell | 74 | St. Mary's Hospital Medical School | 52 |
| Garrett (Dr.) Memorial Home, Conway | xlviii | School of Medicine of the Royal Colleges, Edinburgh | 62 |
| Home for Epileptics, Maghull | 76 | Shropshire Orthopaedic Hospital and | |
| Lansdown Hospital and Nursing Home, Bath | 72 | Acnes Hunt Surgical Home, Oswestry | 64 |
| Minerva House Nursing Home, London | xiv | University of Aberdeen | 61 |
| Normansfield, Teddington (Mentally Deficient) | 79 | — — Birmingham | 64 |
| Oxley Grove, Hatch End (Borderline Nerve Cases) | 74 | — — Bristol | 58 |
| Rizwan Nursing Home, Broadstone | 84 | — — Edinburgh | 59 |
| Rock Hall House, Combe Down, Bath (Mentally Defective Children) | 79 | — — Liverpool | 61 |
| Rollier's (Dr.) Clinics, Leyton | 75 | — — Manchester | 60 |
| Rowley Lodge, Rowley Green, High Barnet (Backward Children) | 76 | — — St. Andrews | 61 |
| | | University College Hospital Medical School | 11 |
| | | University Examination Postal Institution | 67 |
| | | Woolside Nerve Hospital, London | 74 |
| HOTELS AND BOARDING ESTABLISHMENTS— | | | |
| Bath, Pulteney Hotel | 96 | | |
| Bognor, Royal Norfolk Hotel | 98 | | |
| Buxton, Old Hall Hotel | 94 | | |
| Cromer, Eversley Private Hotel | 94 | | |
| Droitwich Spa, Ayrshire House Boarding Establishment | 99 | | |
| — — Park Hotel | 98 | | |
| — — Raven Hotel | 98 | | |
| — — Worcestershire Brine Baths Hotel | 99 | | |
| Eastbourne, Lansdowne Hotel | 99 | | |
| Hindhead, The Beacon Hotel | 97 | | |
| Landrindol Wells, Ye Wells Hotel | 96 | | |

| HOTELS, ETC.—continued | PAGE |
|-------------------------------------|------|
| London, Kingsley Hotel | 5 |
| — Thackeray Hotel | 5 |
| Madeira, Reid's Palace Hotel .. | 92 |
| Peebles, Hotel Hydro | 93 |
| Southport, Prince of Wales Hotel .. | 98 |
| — Royal Hotel | 98 |
| Torquay, Pahn Court Hotel | 97 |
| West Kirby Hydro Hotel | 94 |

HYDRO-THERAPEUTIC ESTABLISHMENTS, BATHS, SPAS, HEALTH RESORTS, MEDICAL ELECTRICITY, RADIANT HEAT, RADIUM, Etc.—

| | |
|---------------------------------|--------|
| Bad-Nauheim, Germany | xlvi |
| Baden-Baden, Germany | xlvii |
| Ilkley, Craglands Hydro | 94 |
| London, Dowsing Radiant Heat .. | 69 |
| — Radium Institute | 69 |
| Matlock, Smedley's Hydro | 95 |
| Peebles, Hotel Hydro | 93 |
| Schlangenbad Spa | xliv |
| Torquay Spa | xlviii |
| West Kirby Hydro Hotel | 94 |

ILLUSTRATIONS—

| | |
|------------------------------|----|
| Swain, John & Son Ltd. | 22 |
|------------------------------|----|

INCOME TAX ADVICE—

| | |
|---------------------|-----|
| Hardy & Hardy | 595 |
|---------------------|-----|

INEBRIATES (HOMES FOR)—

| | |
|---------------------------------------|----|
| Caldecote Hall, Nuneaton | 81 |
| Darlington House, Rickmansworth .. | 82 |
| Mansion, The, Beckenham Park .. | 82 |
| Norwood Sanatorium, Beckenham Park .. | 82 |
| Old Hill House Ltd., Chislehurst .. | 81 |
| Renflesham Hall, Woodbridge | 82 |

INSURANCE, LIFE, ADVICE CONCERNING—

| | |
|--------------------------------------|----|
| Tidswell, Ernest, M.A., F.F.I. | 20 |
|--------------------------------------|----|

LABORATORIES—

| | |
|---|----|
| Laboratories of Pathology and Public Health, London | 70 |
|---|----|

LIBRARIES (MEDICAL AND SCIENTIFIC)—

| | |
|-------------------------------|-------|
| Lewis, H. K. & Co. Ltd. | xliii |
|-------------------------------|-------|

LIFE ASSURANCE, ADVICE CONCERNING—

| | |
|--------------------------------------|----|
| Tidswell, Ernest, M.A., F.F.I. | 20 |
|--------------------------------------|----|

MESSAGE, ELECTRICAL TREATMENT, EXERCISES, Etc.

| | |
|---|----|
| Male Nurses' Association, London .. | 73 |
| Swedish Institute and Clinique, London .. | 77 |

MEDICAL AGENTS AND SOCIETIES—

| | |
|---|----|
| London & Counties Medical Protection Society Ltd. | 71 |
|---|----|

MENTAL INSTITUTIONS, HOSPITALS, AND HOMES—

| | |
|---------------------------------------|-----|
| Ashwood House, Kingswinnford | 113 |
| Bailbrook House, Bath | 114 |
| Barnsley Hall, Bromsgrove | 117 |
| Barnwood House, Gloucester | 115 |
| Bethel Hospital, Norwich | 105 |
| Bethlem Royal Hospital, Beckenham .. | 101 |
| Bishopstone House, Bedford | 78 |
| Bootham Park, York | 78 |
| Boreatton Park, Baschurch | 107 |
| Brunton House, Lancaster | 80 |
| Bryn-y-neuadd Hall, Llanfairfechan .. | 103 |
| Camberwell House, S.E.5 | 110 |
| Cheadle Royal, Cheadle, Cheshire .. | 106 |

| | PAGE |
|---|------|
| Chiswick House, Pinner, Middlesex .. | 100 |
| City of London Mental Hospital, Dartford .. | 110 |
| Clarence Lodge, Clapham Park, S.W. .. | 112 |
| Coppice, The, Nottingham | 104 |
| Coton Hill Mental Hospital, Stafford .. | 113 |
| Derby Mental Hospital, Derby | 111 |
| Detmar, Dr., Munich | 105 |
| East Sussex County Mental Hospital .. | 112 |
| Exeter Mental Hospital | 115 |
| Farnham House, Dublin | 113 |
| Fenstanton, S.W.2 | 116 |
| Flower House, Beckenham Lane, S.E. .. | 115 |
| Grange, The, near Rotherham | 111 |
| Hampstead, Glasnevin, and Highfield, Drumcondra, Dublin | 114 |
| Haydock Lodge, Newton-le-Willows .. | 109 |
| Herts County Mental Hospital | 117 |
| Highfield Hall, St. Albans | 117 |
| Holloway Sanatorium, Virginia Water .. | 107 |
| Kingsdown House, Box, near Bath .. | 108 |
| Laverstock House, Salisbury | 100 |
| Lawn, The, Lincoln | 100 |
| Leigh House, Hatton, Warwick | 116 |
| Littlton Hall, Brentwood | 106 |
| Maryville, Dublin | 113 |
| Maudsley Hospital, London | 55 |
| Moor House, Tamworth | 114 |
| Moulton Park, Northampton | 103 |
| New Saughton Hall, Pulten, N.B. .. | 104 |
| Newlands House, London | 115 |
| Northumberland House, N. | 102 |
| Northwoods, Winterbourne, Bristol .. | xlvi |
| Old Manor, Salisbury | 112 |
| Peckham House, Peckham, S.E. | 110 |
| Plympton House, South Devon | 114 |
| Portsmouth City Mental Hospital .. | 100 |
| Retreat, The, Armagh | 108 |
| Royal Albert Institution, Lancaster .. | 80 |
| Royal Earlswood Institution, Redhill .. | 79 |
| St. Andrew's Hospital, Northampton .. | 103 |
| St. Andrew's, Stitches, Hawick | 118 |
| St. Patrick's Hospital, Dublin | 102 |
| Sharnbury House, Farnby-by-Sea .. | 111 |
| Silver Birches, Epsom | 117 |
| Springfield House, near Bedford | 112 |
| Stoke Park Colony, Bristol (Children) .. | 89 |
| Tue Brook Villa, Liverpool | 117 |
| Uplands, Macclesfield | 116 |
| Wantage House, Northampton | 103 |
| Warneford, The, Oxford | 106 |
| Wye House, Buxton | 117 |
| Wyke House, Isleworth | 110 |

MICROSCOPES AND SCIENTIFIC APPARATUS—

| | |
|-------------------------------|-----|
| Flatters & Garnett Ltd. | 148 |
| Millikin & Lawley | 140 |

MINERAL WATERS, Etc.—

| | |
|------------------------------------|----------|
| Camwall Ltd., 'Aquaperia' Water .. | 167 |
| Ingram & Royle Ltd., 'Vichy' | 598, 604 |

NURSES' INSTITUTIONS—

| | |
|--|----|
| Cavendish Temperance Male Nurses' Corporation Ltd., London | 76 |
| Male Nurses' Association, London | 73 |
| New Mental Nurses' Co-operation, London .. | 72 |
| Norfolk Square Nursing Association and Hyde Park Association of Trained Nurses, London | 77 |
| Nurses' Association, London | 73 |
| Retreat, The, York (Mental) | 77 |

OPTICIANS (DISPENSING AND MANUFACTURING)—

| | |
|-------------------------------|------|
| Bruce, Green & Co. Ltd. | 144 |
| Curry & Paxton Ltd. | xii |
| Keeler, C. Davis | 128 |
| Spiller, George Ltd. | xiii |

| | PAGE |
|---|---|
| PUBLISHERS —(see also Index to Books and Periodicals, page 10) | |
| Arrowsmith, J. W. Ltd. | 48 |
| Ash & Co. Ltd. | 26 |
| Baillière, Tindall & Cox | 22, 23, 27, 40 |
| Black, A. & C. Ltd. | 39 |
| Cape, Jonathan Ltd. | 28 |
| Cassell & Co. Ltd. | 29 |
| Churchill, J. & A. | 30, 31 |
| Constable & Co. Ltd. | 51 |
| Heinemann, Wm. (Medical books) Ltd. . . | 26 |
| H.M. Stationery Office | 35 |
| Homeopathic Publishing Co. | 25 |
| Lewis, H. K. & Co. Ltd. | xliii, xliiv, 26, 32, 33 |
| Livingstone, E. & S. | 37 |
| Oliver & Boyd | xlv |
| Oxford University Press | xliiv, 34 |
| Philip, Geo. & Son Ltd. | 6 |
| Prescriber Offices | 24 |
| Scientific Publishing Co. | 26 |
| Thacker, W. & Co. (Thacker, Spink & Co.) | 38 |
| University of London Press Ltd. | 23 |
| Wright, John & Sons Ltd. | xxiv, 5, 6, 13, 17, 19, 22, 25, 26, 40-44, 60, 61 |

| | |
|------------------------------|-----|
| REFRIGERATORS, ETC. — | |
| Electrolux Ltd. | 135 |

| | |
|--|--------|
| SANATORIA FOR TUBERCULOSIS — | |
| Blencourt Sanatorium, Threlkeld | 89 |
| Cotswold Sanatorium, Cranham | 84 |
| East Anglian Sanatorium, Nayland . . . | 88 |
| Farnwood Sanatorium, Ascot | 84 |
| Garrett (Dr.) Memorial Home, Conway . | xlviii |
| Gramplan Sanatorium, Kingussie | 87 |
| Leyrin Sanatoria, Switzerland | 91 |
| Montana Hall Sanatorium, Montana . . | 83 |
| Mundesley Sanatorium, Norfolk | 86 |
| National Children's Home and Orphanage, Sanatorium and Open-air School . . . | 85 |
| Nordrach-upon-Mendip Sanatorium, Blagdon | 86 |
| Park Sanatorium, Davos-Platz | 91 |
| Pendyffryn Hall Sanatorium, Penmaenmawr | 87 |
| Prior Place Sanatorium, Camberley . . . | 86 |
| Royal National Hospital for Consumption and Diseases of the Chest, Ventnor . . | 63 |
| Sanatorium La Maison Blanche, Venice, France | 90 |
| Sanatorium du Mont-Duplan, Nîmes, France | 94 |
| Schatzalp Sanatorium, Davos-Platz . . . | 89 |
| Tor-na-Dee Sanatorium, Murtle | 89 |
| Vale of Clwyd Sanatorium, Ruthin . . . | 88 |
| Victoria Sanatorium, Davos | 91 |
| Wensleydale Sanatorium, Aysgarth . . . | 88 |

| | |
|-----------------------------------|-----|
| SANATORIA SHELTERS, Etc. — | |
| Hobson, J. T. & Co. | 148 |
| Strawson, G. F. | 148 |

| | |
|---------------------------------|-----|
| SANITARY FITTINGS — | |
| Elsan Manufacturing Co. | 149 |

| | |
|-----------------------------------|----|
| SEA VOYAGES, TOURS, Etc. — | |
| Bibby Bros. & Co. | 92 |

| | |
|------------------------------|----|
| SECRETARIES — | |
| Kensington College | 66 |

| | |
|--|--|
| SPAS, HEALTH RESORTS, Etc. — | |
| (see "Hydro-therapeutic Establishments", etc.) | |

| | |
|-------------------------------------|----|
| STAMMERING, SPEECH DEFECTS — | |
| Miall, Eric J., A.L.C.M. | 68 |
| Moore, Joseph | 68 |
| Schnelle, A. C. | 68 |
| Ward, Miss Kingston | 68 |

| | |
|--|-------------------------|
| SURGICAL INSTRUMENTS AND APPLIANCES, BANDAGES, Etc. — | |
| Adair, Dutt & Co. Ltd. | 132 |
| Allen & Hanburys Ltd. | 124, 125 |
| Bailey, W. H. & Son | 145 |
| Boots Chemists, Belts | 138 |
| Braun, E. | 132 |
| Critchley, J. & Sons, Splints | 126 |
| Curtis, H. E. & Son, Abdominal Supports | 143 |
| Davidson, G., Scalytic Light | xvii |
| Davis & Geck, Inc., Sutures | xix |
| Dental Manufacturing Co. Ltd., Dental Appliances | 142 |
| Desoutter Bros. Ltd., Artificial Limbs . . | liv |
| De Vilbiss Co. Ltd., Sprays | 144 |
| Domen Belts Co. Ltd. | xvi |
| Down Bros. Ltd. | 118-121 |
| Dowsing Radiant Heat Co. Ltd. | 69 |
| Electrolux Ltd., Refrigerators, etc. . . . | 135 |
| Flatters & Garnett Ltd., Microscopic Accessories | 148 |
| Frost & Co., Surgical Supports | 138 |
| Garner, J. & Son | 143 |
| Gaw, Donald M. | xxvi, xxvii, 130, 131 |
| Genito-Urinary Mfg. Co. Ltd. | 126, 127 |
| Grossmith, W. R. Ltd., Artificial Limbs . . | 142 |
| Grout & Co. Ltd., Bandages | 139 |
| Hanger, J. E. & Co. Ltd., Artificial Legs | xxv |
| Harding, R. A., Invalid Chairs | liii |
| Haywood, J. H. Ltd., Appliances | 136 |
| Hewlett, C. J. & Son Ltd. | 141 |
| Hill, W. & Co., Orthopedic Appliances . . | 134 |
| Hilliard & Son | 147 |
| Holborn Surgical Instrument Co. Ltd. . . | 129 |
| Hoskins & Sewell Ltd., Hospital Beds . . | iv |
| King, A. Charles Ltd. | 134 |
| Krohne & Seemann | 138 |
| Masters, M. & Sons Ltd., Artificial Legs | xviii |
| Mayer & Phelps | 122, 123 |
| Millikin & Lawley | 140 |
| Montague, J. H. | 141 |
| Norrie Crepe Bandages | 139 |
| Paché & Son, Artificial Eyes | 147 |
| Pearce, Allen, Artificial Limbs, etc. . . . | 150 |
| Reynolds & Branson Ltd. | xiv, xv |
| Robinson & Sons Ltd., Surgical Dressings | 133 |
| Rogers, Frank A., Sprays | xii |
| Salmon Ody Ltd., Trusses | 140 |
| Smith, John & Son (Glasgow) Ltd. . . . | xvii |
| Sulderick & Co. | 137 |
| Sumner, R. & Co. Ltd. | Front Cover, and iv-vii |
| Thackray, Chas. F. | xix-xxiii |
| Weiss, John & Son Ltd. | 142 |
| Wilson, W. J. & Co. Ltd., Artificial Limbs | liii |
| Woolley, Jas. Sons & Co. Ltd. | 144 |
| Young, Archd. & Son Ltd. | 140 |

| | |
|---------------------------------|-----|
| TAILORS — | |
| Miller, R. & Co. Ltd. | 146 |
| Studd & Millington Ltd. | 147 |

| | |
|--------------------------------------|----|
| TYPEWRITING AND DUPLICATING — | |
| Kensington College | 66 |

| | |
|--|-----|
| VACCINES, CALF — | |
| Heinemann, Wm. (Medical Books) Ltd. . . | 165 |
| Jenner Institute for Calf Lymph Ltd. . . | 165 |

| | |
|---------------------------------------|------|
| X-RAY APPARATUS — | |
| Dean, A. E. & Co. | x |
| Ifford Ltd., X-ray Films | viii |
| Kodak Ltd., X-ray Films | ix |
| Mottershead & Co. | 150 |
| Victor X-Ray Corporation Ltd. | xi |

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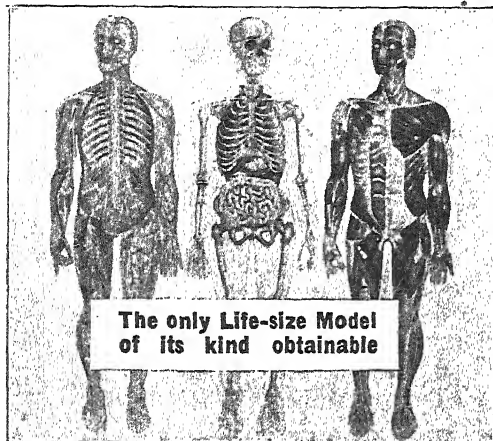
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Alphabetical Index to Advertisers.

| | PAGE | | PAGE |
|--|--------------------|--|-----------------------|
| Adair, Dutt & Co., Ltd., Surgical Appliances | 132 | Collis Browne's Chlorodyne | 176 |
| Allen & Hanburys Ltd., Chemists and Surgical Instruments | 121, 125, 154, 155 | Colthurst House Schools for Epileptics | 80 |
| Alliance Drug & Chemical Co. | 152 | Constable & Co. Ltd., Publishers | 51 |
| Anglo-French Drug Co. Ltd. | xxx | Copple, The, Nottingham, Mental Hospital | 104 |
| Archer Nerve Training Colony, King's Langley | 76 | Coton Hill Mental Hospital, Stafford | 113 |
| Arrowsmith, J. W. Ltd., Publishers | 48 | Cotswold Sanatorium, Cranham | 84 |
| Ash & Co. Ltd., Publishers | 25 | Craiglands Hydro, Ilkley | 94 |
| Ashwood House, Kingswinford, Mental Home | 113 | Craunmoor School, Highblythe-on-Sea | xxvi |
| Ayrshire House, Boarding Establishment, Drottwich Spa | 99 | Criehley, J. & Sons, Artificial Limbs | 136 |
| | | Crookes Laboratories, Chemists | xxxix |
| | | Curry & Paxton Ltd., Opticians | xii |
| | | Curtis, H. E. & Son Ltd., Abdominal Support | 145 |
| Bad Nauheim, Germany | xvii | | |
| Baden-Baden, Germany | xviii | Dalrymple House, Rickmansworth, Inebriates | 82 |
| Bailbrook House, Bath, Mental | 114 | David Lewis Colony, Warford, Epileptic | 89 |
| Bailey, W. H. & Son, Surgical Appliances | 145 | Davidson, G., Scalytic Light | xviii |
| Baillière, Tindall & Cox, Publishers | 22, 23, 27, 46 | Davis & Geck, Inc., Sutures | xix |
| | iii, 600 | Dean, A. E. & Co., X-ray and Electro-medical Apparatus | x |
| Barnardo's (Dr.) Homes | 117 | Dental Manufacturing Co. Ltd. | 142 |
| Barnsley Hall Mental Home, Bromsgrove | 115 | Denver Chemical Mfg. Co. | xxxv |
| Barrow House, Gloucester, Mental | xxxvi-xxxvii | Derby Mental Hospital, Derby | 111 |
| Bayer Products Ltd., Chemists | 97 | Desoutter Bros. Ltd., Artificial Limbs | lii |
| Beaumont Hotel, Huddersfield | 145 | Detmar, Dr., Munich, Nerves | 105 |
| Beutson, Clark & Co. Ltd., Medical Glass Manufacturers | 163 | DeVilbiss Co. Ltd., Sprays | 144 |
| Bonquo & Co. Ltd., Chemists | 105 | Donen Belts Co. Ltd. | xvi |
| Bethel Hospital, Norwich, Mental | 101 | Dorset House, Clifton, Functional Nervous Disorder | xliv |
| Bethlem Royal Hospital, Mental | 92 | Dowie & Marshall Ltd., Boot and shoe Makers | 145 |
| Bibby Bros. & Co., Sea Voyages | xlii | Down Bros. Ltd., Surgical Instruments | 118-121 |
| Birco Laboratories | 78 | Dowsing Radiant Heat Co. Ltd. | 69 |
| Bishopstone House, Bedford, Mental Home | 39 | Duncan, Flockhart & Co., Chemists | xxviii |
| Black, A. & C. Ltd., Publishers | 89 | | |
| Blencathra Sanatorium, Threlkeld | 78 | East Anglian Sanatorium, Nuyland | 88 |
| Bootham Park, York, Mental Hospital | 138 | East Sussex County Mental Hospital | 112 |
| Boots Chemists, Surgical Belts | 107 | Elme Ltd., Chemists | xlii |
| Boreatton Park, Barchurch, Mental Home | 74 | Educational Institute of Scotland | 66 |
| Bowden House Nursing Home, Harrow | 132 | Electrolux Ltd., Refrigerators | 135 |
| Braun, B., Surgical Appliances | 48 | Elstan Manufacturing Co., Chemical Closet | 149 |
| Bristol Medico-Chirurgical Journal | 14 | English Grains Co. Ltd., Yeast | 162 |
| Britannic Assurance Co. Ltd. | xxxix | Eversley Private Hotel, Cromer | 94 |
| British Colloids Ltd., Chemists | 44 | Ewell Grove Nursing Home, Ewell | 74 |
| British Journal of Surgery | 46 | Exeter Mental Hospital | 115 |
| British Journal of Tuberculosis | 51 | | |
| British Journal of Urology | xlvii | Farnham House, Dublin, Mental Home | 113 |
| British Organotherapy Co. Ltd. | 149 | Farmwood Sanatorium, Ascot | 84 |
| Briton Perry Chemical and Manure Co. Ltd., Disinfectants, etc. | xi | Fellowship of Medicine and Post-Graduate Medical Association | 66 |
| Brown, Gore & Welch Ltd., Brandies | 144 | Fenstanton, S.W.2, Mental Home | 116 |
| Bruce, Green & Co. Ltd., Opticians | 80 | Ferris & Co. Ltd., Chemists | 158 |
| Brunton House, Lancaster, Feeble-minded | 24 | | |
| Bryce, Wm., Medical Bookseller | 103 | Flatters & Garnett Ltd., Microscope Accessories | 148 |
| Bryn-y-nedd Hall, Llanfairfechan, Mental | 153 | Fletcher, Fletcher & Co. Ltd., Coccolina | 163 |
| Burroughs Wellcome & Co., Chemists | | Flower House, Beckenham Lane, S.E., Mental Home | 115 |
| | | Foye, W. & G. Ltd., Booksellers | xliv |
| Caldecote Hall, Nuneaton, Alcoholism and Drug Addiction | 81 | Fromy, Rogee & Co., Brandies | 162 |
| Camberwell House, S.E.5, Mental Home | 110 | Frost & Co., Surgical Belts | 138 |
| Camwall Ltd., 'Aqua-perla' Water | 167 | | |
| Cancer Review, The | 43 | Gardner, J. & Son, Instruments | 143 |
| Cape, Jonathan Ltd., Publishers | 28 | Garrett (Dr.), Memorial Home, Conway | xlviii |
| Cassell & Co. Ltd., Publishers | 29 | Gautier Frères' Brandies | xi |
| Cavendish Temperance Male Nurses' Corporation Ltd., London | 76 | Gaw, Donald M., Surgical Instruments | xxvi, xxvii, 130, 131 |
| Cedar Grange Nursing Home, Caterham | 75 | | 120, 127 |
| Cheadle Royal, Cheadle, Mental Hospital | 106 | Giles, Schacht & Co., Chemists | lx, 599 |
| Chiswick House, Pinner, Mental Hospital | 100 | Gordon Hospital for Rectal Diseases | 56 |
| Churchill, J. & A., Publishers | 30, 31 | Grampian Sanatorium, Kingussie | 87 |
| City of London Mental Hospital, Dartford | 110 | | |
| Clarence Lodge, Clapham Park, S.W., Mental | 112 | | |
| Clay & Abraham Ltd., Chemists | iii | | |
| Clayton Aniline Co. Ltd., Chemists | xxviii | | |

| | PAGE | | PAGE |
|---|------------------------|--|----------|
| Grange, The, Rotherham, Mental Home .. | 111 | Maryville, Dublin, Mental Home .. | 113 |
| Grossmith, W. R. Ltd., Artificial Limbs .. | 142 | Masters, M. & Sons Ltd., Artificial Legs .. | xviii |
| Grout & Co. Ltd., Bandages .. | 139 | Maudsley Hospital, London .. | 55 |
| Hamstead, Glasnevin, and Highfield, Drum- condra, Dublin, Private Asylums .. | 114 | May, Roberts & Co. Ltd., Chemists .. | 166 |
| Hanser, J. E. & Co. Ltd., Artificial Legs .. | xxv | Mayer & Phelps, Surgical Instruments .. | 122, 123 |
| Harding, R. A., Invalid Chairs .. | liii | Mazawattee Tea Co. Ltd. .. | 163 |
| Harby & Hardy, Income Tax Experts .. | 595 | <i>Medical Directory</i> , 1931 .. | 30 |
| Haydock Lodge, Newton-le-Willows, Mental Hospital .. | 109 | <i>Medical Officer, The</i> .. | 49 |
| Haywood, J. H. Ltd., Surgical Appliances .. | 136 | <i>Medical Press and Circular</i> .. | 47 |
| Heinemann, Wm. (Medical Books) Ltd. .. | 36, 165 | Miall, Eric J., A.L.C.M., Stammering, etc. .. | 68 |
| Herts County Mental Hospital, St. Albans .. | 117 | Middlesex Hospital Medical School .. | 53 |
| Hewlett, C. J. & Son Ltd., Chemists and Surgical Appliances .. | 141, 160 | Miller, B. & Co. Ltd., Tailors .. | 146 |
| Highfield Hall Mental Home, St. Albans .. | 117 | Millikin & Lawley, Surgical Instruments .. | 140 |
| Hill, W. & Co., Orthopaedic Appliances .. | 134 | Minerva House Nursing Home, London .. | xiv |
| Hilliard & Son, Nutrition Bays .. | 147 | Moat House, Tamworth, Mental Home .. | 111 |
| H.M. Stationery Office, Publishers .. | 35 | Modern Pharmaceuticals Ltd., Chemists .. | 167 |
| Hobson, J. T. & Co., Revolving Shelters .. | 148 | Montague, J. H., Surgical Instruments .. | 141 |
| Holborn Surgical Instrument Co. Ltd. .. | 129 | Montana Hall Sanatorium, Montana .. | 83 |
| Holloway Sanatorium, Virginia Water, Men- tal Hospital .. | 107 | Montgomerie & Co. Ltd., Berina Food .. | 150 |
| Home for Epileptics, Mughill .. | 76 | Moore, Joseph, Stuttering, etc. .. | 68 |
| Homeopathic Publishing Co. .. | 25 | Mottershead & Co., Electro-medical and X-ray Apparatus .. | 150 |
| <i>Homeopathic World</i> .. | 25 | Moulton Park, Northampton, Mental Home .. | 103 |
| Hormones & Chalones Ltd., Chemists .. | 164 | Mundesley Sanatorium, Norfolk .. | 86 |
| Hoskins & Sewell Ltd., Hospital Beds .. | iv | Napp, H. R. Ltd., Chemists .. | 159 |
| Hospital for Epilepsy and Paralysis .. | 56 | National Children's Home and Orphanage, Open-Air School and Sanatorium .. | 85 |
| Hospital for Sick Children, W.C.1 .. | 65 | New Mental Nurses' Co-operation, London .. | 72 |
| Ilford Ltd., X-ray Films .. | viii | New Saughton Hall, Polton, N.B., Mental .. | 104 |
| <i>Indian Journal of Medical Research</i> .. | 38 | Newlands House, S.W.17, Mental Hospital .. | 115 |
| <i>Indian Medical Gazette</i> .. | 38 | Nordrach-upon-Mendip Sanatorium, Blagdon .. | 86 |
| Ingram & Royle Ltd., Mineral Waters .. | 598, 604 | Norfolk Square Nursing Association and Nurses, London .. | 77 |
| <i>Irish Journal of Medical Science</i> .. | 50 | Normansfield, Teddington, Mentally De- ficient .. | 79 |
| Isaacs, I. & Co., Bottles .. | 146 | North-East London Post-graduate College .. | 63 |
| Jenner Institute for Calf Lymph Ltd. .. | 165 | Northumberland House, N., Mental Home .. | 102 |
| Kaylenc Ltd., Chemists .. | xxxiii | Northwoods, Winterbourne, Bristol, Mental Home .. | xvii |
| Keeler, C. Davis, Optician .. | 128 | Norvic Crepe Bandages and Binders .. | 139 |
| Kenington College .. | 66 | Norwegian Medicinal Cod Liver Oil .. | lviii |
| King, A. Charles Ltd., Surgical Instruments .. | 134 | Norwich Union Life Insurance Society .. | 14 |
| King's College Hospital Medical School .. | 87 | Norwood Sanatorium, Beckenham Park, Inebriate Homes .. | 82 |
| Kingsdown House, Box, near Bath, Mental Kingsley Hotel, London .. | 108 5 | Nurses' Association, London .. | 73 |
| Kodak Ltd., X-ray Film, etc. .. | ix | Old Hall Hotel, Buxton .. | 94 |
| Krohn & Sesemann, Surgical Instruments .. | 138 | Old Hill House Ltd., Chislehurst, Alcoholism, Drugs, and Tropical Ailments .. | 81 |
| Laboratories of Pathology and Public Health, London .. | 70 | Old Manor, Salisbury, Mental Hospital .. | 112 |
| <i>Lancet, The</i> .. | 45 | Oliver & Boyd, Publishers .. | xlv |
| Lansdown Hospital and Nursing Home, Bath .. | 72 | Oxford University Press .. | xliv, 34 |
| Lansdowne Hotel, Eastbourne .. | 39 | Oxhey Grove, Hatch End, Borderline Nerve Cases .. | 74 |
| Laverstock House, Salisbury, Mental Home .. | 100 | Pacie & Son, Artificial Eyes .. | 147 |
| Lawn, The, Lincoln, Mental Hospital .. | 109 | Paines & Byrne Ltd., Chemists .. | xxxiii |
| Leigh House, Hatton, Mental Home .. | 116 | Palm Court Hotel, Torquay .. | 97 |
| Lewis, H. K. & Co. Ltd., Publishers and Medical Library .. | xliii, xlv, 26, 32, 33 | Park Hotel, Droitwich .. | 98 |
| Leyshin Sanatoria, Switzerland .. | 91 | Park Sanatorium, Davos-Platz .. | 91 |
| Littleton Hall, Brentwood, Mental Home .. | 106 | Parke, Davis & Co., Chemists .. | xxix |
| Livingstone, E. & S., Publishers .. | 37 | Pearce, Allen, Artificial Limbs, etc. .. | 150 |
| London Clinic of Psycho-analysis .. | 67 | Peckham House, Peckham, S.E., Mental .. | 110 |
| London & Counties Medical Protection Society Ltd. .. | 71 | Peebles Hotel Hydropathic .. | 93 |
| London Fever Hospital .. | 64 | Pendyffryn Hall Sanatorium, Penmaenmawr .. | 87 |
| London Foot Hospital .. | 61 | Petrolagar Laboratories Ltd., Chemists .. | 156 |
| London Hospital Medical College .. | 57 | Philip, Geo. & Son Ltd., Anatomical Model .. | 6 |
| London School of Dermatology .. | 54 | Plaistow Hospital, London .. | 65 |
| Lycoc Yeast Tablet Co. Ltd. .. | 162 | Plympton House, Devon, Mental .. | 114 |
| Lyncombe Hall School, Bath .. | 67 | Portal, Dingwall & Norris, Lemon Hart Rum .. | xlii |
| Macfarlan, J. F. & Co., Chemists .. | xxxiv | Portsmouth City Mental Hospital .. | 109 |
| Male Nurses' Association, London .. | 73 | <i>Prescriber, The</i> .. | 24 |
| Manchester Tutorial College .. | 66 | Prince of Wales Hotel, Southampton .. | 98 |
| Mansion, The, Beckenham Park, Inebriates .. | 82 | Prince of Wales's General Hospital .. | 63 |
| Martindale, W., Chemist .. | 165 | Prior Place Sanatorium, Camberley .. | 86 |
| | | Proseldis Chemical Co. .. | 161 |
| | | Pulteney Hotel, Bath .. | 96 |

| | PAGE | | PAGE |
|--|---------|---|-----------|
| Queen Mary's Hospital for the East End .. | 57 | Stevens, S. & Co., Chemists .. | 164 |
| Radium Institute, London .. | 69 | Stoke Park Colony, Stapleton, Bristol, Men- tally Defective Children .. | 50 |
| Rattray, A. Dewar, Whiskies .. | 1vi | Strawson, G. F., Open-Air Shelters .. | 148 |
| Raven Hotel, Droitwich .. | 98 | Studd & Millington Ltd., Tailors .. | 147 |
| Reid's Palace Hotel, Madeira .. | 92 | Sudlerick & Co., Instruments .. | 157 |
| Reliance Lubricating Oil Co. Ltd. .. | 149 | Summer, R. & Co. Ltd., Surgical Instruments and Chemists, Inside Front Cover, and iv-vii | |
| Rendlesham Hall, Woodbridge, Inebriates .. | 82 | Swain, John & Son Ltd., Engravers .. | 22 |
| Retreat Private Mental Home, Armagh .. | 108 | Swedish Institute and Clinic, London .. | 77 |
| Retreat, The, York (Mental Nurses) .. | 77 | | |
| Reynolds & Branson Ltd., Chemists and Surgical Instruments .. | xiv, xv | Tamar Indien Grillon .. | xxviii |
| Rigollot's Mustard Leaves .. | xxviii | Taunton School for Boys, Taunton .. | 56 |
| Rizwan Nursing Home, Broadstone .. | 84 | Thacker, Spink & Co. (W. Thacker & Co.), Publishers .. | 58 |
| Robertson, John & Co., Chemists .. | 161 | Thackeray Hotel, London .. | 5 |
| Robinson & Sons Ltd., Surgical Dressings .. | 133 | Thackray, Chas. F., Instruments .. | Aix-xviii |
| Rock Hall House, Combe Down, Bath, Men- tally Defective Children .. | 79 | Thin, James, Bookseller .. | xiv |
| Rogers, Frank A., Sprays .. | xii | Thomson, R., Chemist .. | xlii |
| Rollier's (Dr.) Clinics, Leysh .. | 75 | Tidswell, Ernest, M.A., F.F.I., Life Assur- ance Consultant .. | 20 |
| Rotunda Hospital, Dublin .. | 62 | Tor-na-Dee Sanatorium, Murtie .. | 89 |
| Rowley Lodge Educational Home for Back- ward Children, High Barnet .. | 76 | Torquay Spa .. | Alviii |
| Royal Albert Institution, Lancaster, Feeble- minded Children .. | 80 | Tue Brook Villa, Liverpool, Mental Home .. | 117 |
| Royal College of Surgeons, Edinburgh .. | 61 | | |
| Royal Dental Hospital of London .. | 69 | University of Aberdeen .. | 61 |
| Royal Earlswood Institution, Redhill, Men- tal Defectives .. | 79 | — — Birmingham .. | 64 |
| Royal Hotel, Southport .. | 98 | — — Bristol .. | 58 |
| Royal London Ophthalmic Hospital .. | 63 | — — Edinburgh .. | 59 |
| Royal National Hospital for Consumption and Diseases of the Chest, Ventnor .. | 63 | — — Liverpool .. | 61 |
| Royal Norfolk Hotel, Bognor .. | 98 | — — Manchester .. | 60 |
| Royal Scottish National Institution, Larn- mentally Defective Children .. | 78 | — — St. Andrews .. | 60 |
| Ruthin Castle, North Wales, Private Hospital for Internal Diseases .. | 1 | University College Hospital Medical School .. | ii |
| | | University Examination Postal Institution .. | 67 |
| Saccharin Corporation Ltd., Anaesthetics, etc. | xxxv | University of London Press Ltd. | 23 |
| St. Amand Manufacturing Co., Chemists .. | 157 | Uplands Private Mental Home, Macclesfield .. | 116 |
| St. Andrew's Hospital, Northampton, Mental .. | 103 | | |
| St. Andrew's, Stitches, Hawick, Mental Home .. | 116 | Vale of Clwyd Sanatorium, Ruthin .. | 88 |
| St. John's Skin Hospital, London .. | 54 | Valentine's Meat-Juice Co. .. Front End Paper | |
| St. Mary's Hospital Medical School .. | 52 | Vichy-Célestins, Waters .. | 508, 604 |
| St. Patrick's Mental Hospital, Dublin .. | 102 | Victor X-ray Corporation Ltd., Electro- medical Apparatus .. | xi |
| Salamon & Co., Ltd., Chemists .. | 166 | Victoria Sanatorium, Davos .. | 91 |
| Salmon Ody Ltd., Trusses .. | 140 | Vitalia Ltd., Meat Juice .. | 1vi |
| Sanatorium La Maison Blanche, Vence, France .. | 90 | | |
| Sanatorium du Mont-Duplan, Nîmes, France .. | 90 | Wantage House, Northampton, Mental Home .. | 103 |
| Schatzalp Sanatorium, Davos-Platz .. | 89 | Ward, Miss Kingdon, Speech Defects .. | 68 |
| Schering Ltd., Chemists .. ii, 596, 597 | | Warneford, The, Oxford, Mental Hospital .. | 106 |
| Schlängenbad Spa .. | xlix | Weiss, John & Son Ltd., Surgical Instruments .. | 142 |
| Schnelle, A. C., Staunmering .. | 68 | Wellington School, Somerset .. | 65 |
| School of Medicine of the Royal Colleges, Edinburgh .. | 62 | Wensleydale Sanatorium, Aysgarth .. | 88 |
| Schweitzer's Cocoa-tina .. | 163 | Wesleyan and General Assurance Society .. | 17 |
| Scientific Publishing Co. | 25 | West Kirby Hydro Hotel, West Kirby .. | 94 |
| Scott & Bowne Ltd., Emulsion .. | 151 | Willows, Francis, Butler & Thompson Ltd., Chemists .. | 160 |
| Shaftesbury House, Formby-on-Sea, Mental .. | 111 | Wilson, W. F. & Co. Ltd., Artificial Limbs .. | liii |
| Shropshire Orthopaedic Hospital and Agnes Hunt Surgical Home, Oswestry .. | 64 | Woodlands Park, Great Missenden, Bucks., Nursing Home .. | 81 |
| Silver Birches, Epsom, Mental Home .. | 117 | Woolside Nerve Hospital, London .. | 74 |
| Smedley's Hydro, Mallock .. | 95 | Woolley, Jas., Sons & Co. Ltd., Surgical Instruments .. | 144 |
| Smith, John & Son (Glasgow) Ltd., Instru- ments .. | xvii | Worcestershire Brine Baths Hotel, Droitwich .. | 99 |
| S. P. Charges Co., Sulphaqua .. | 168 | Wright, John & Sons Ltd., Publishers xxiv, 5, 6, 13, 17, 19, 22, 25, 26, 40-44, 601 | |
| Spiller, George Ltd., Opticians .. | xlii | Wye House Asylum, Buxton .. | 117 |
| Springfield House, near Bedford, Mental Home .. | 112 | Wyke House, Isleworth, Mental .. | 110 |
| | | | |
| | | Ye Wells Hotel, Llandrindod Wells .. | 96 |
| | | Yorkshire Insurance Co. Ltd. | 21 |
| | | Young, Archd. & Son Ltd., Instruments .. | 140 |

Index to Books

Advertised in the Present Volume.

(For "Periodicals" see page 12).

| | PAGE | | PAGE |
|--|---------------------------|--|------------------------------|
| Anæsthesia and Anæsthetics (ROOD & WEBBER) | 29 | Convalescence, Shorter (McCONNELL) | Heinemann 26 |
| Anatomy (WOOLLARD) | Churchill 31 | Cystoscopy (MACALPINE) | Wright xxiv |
| Anatomy, Pathological, Atlas of (MARTIN) | Wright 601 | Dangerous Drugs Register | Wright 22 |
| Anatomy, Shorter (WOLFF) | Lewis 33 | Dental Diseases and Treatment (McASH) | Black 39 |
| Anatomy, Surgical Applied (TREVES & CROVCE) | 29 | Dentistry, Operative (McGHEE) | Churchill 29 |
| Ante-Natal Care (HAULTAIN & FAHMY) | Livingstone 37 | Dermatoglyphs or Occupational Affections of the Skin (WHITE) | Lewis 32 |
| Aphasia in Children (EWING) <i>Orf. Univ. Press</i> | 34 | Devils, Drugs and Doctors (HAGGARD) | Heinemann 26 |
| Arthritis, Chronic (Non-Tuberculous) (FISHER) | Lewis 32 | Diagnosis, Differential, of Main Symptoms (FRENCH) | Wright 40 |
| Asthma (DOUTHWAITE) | Lewis 33 | Diagnosis, Medical (HORDER & GOW) | Cassell 29 |
| Asthma (HALL) | Heinemann 36 | Diagnosis, Surgical (GOULD) | Cassell 29 |
| Atmospheric Conditions in Pithead Baths | H.M. Stationery Office 35 | Drugs Register, Dangerous | Wright 22 |
| Backache (MENNELL) | Churchill 30 | Dysenteries of India (ACTON & KNOWLES) | Thacker 38 |
| Bacteriological Technique (EYRE) | Baillière 27 | Ear, Nose and Throat in Childhood, Diseases of (GUTHRIE) | Black 39 |
| Bacteriology (DBLE) | Churchill 31 | Edamysia (STROGANOFF) | Livingstone 37 |
| Bacteriology, Practical (MACKIE & MCCARNEY) | Livingstone 37 | Endocrine Disorders (CURSCHMANN) | Orf. Univ. Press 34 |
| Bacteriology, Practical (STUTT) | Lewis 33 | Entomology (IMMS) | Orf. Univ. Press 31 |
| Bacteriology in Relation to Medicine, System of | H.M. Stationery Office 35 | Eye, Affections of (REA) | Lewis 33 |
| Biochemistry (FRYDE) | Churchill 31 | Eye Cases, Care of (ELLIOT) | Oxford Med. Publications xlv |
| Brain from Ape to Man (TILNEY) | Lewis 33 | Eye, Diseases of (PARSONS) | Churchill 30 |
| Breast Diseases (EVANS) <i>Univ. of Lond. Press</i> | 23 | Eye, Diseases of (SWANZY) | Lewis 32 |
| Cancer (JEANNENEY) | Lewis 33 | Eye, Diseases and Injuries of (SYM) | Black 39 |
| Cancer, Colour and (REDELL) | Lewis 32 | Eyes in Reading, Movements of | H.M. Stationery Office 35 |
| Cancer of the Lung (DAVIDSON) | Wright 40 | Fellows of the Royal College of Surgeons of England, Parr's Lives of (POWER) | Wright 601 |
| Cancer Problem, Some Aspects of (BELL) | Baillière 27 | Forensic Medicine (SMITH & GLAISTER) | Churchill 31 |
| Cardiology (EAST & BAIN) | Churchill 31 | Fowl, Structure of the (BRADLEY) | Black 39 |
| Cataract, Counseling for (ELLIOT) | Lewis xlv | Gastric and Duodenal Ulcer (MOYNIHAN) | Wright xxiv |
| Catechism Series | Livingstone 37 | Geometrical Optics (PERCIVAL) | Wright 26 |
| Chart Holders | Wright 146 | Glaucoma (ELLIOT) | Lewis xlv |
| Chemistry, Analytical (MEWHELL) | Churchill 31 | Glaucoma (ELLIOT) <i>Oxford Med. Publications</i> | xlv |
| Chemistry, Clinical (STEWART & DUNLOP) | Livingstone 37 | Gynaecological Surgery (BERKELEY & BONNEY) | Cassell 29 |
| Chemistry, Manual of (LUFF & CANDY) | Cassell 29 | Gynaecology, Short Practice of (JELLETT) | Churchill 30 |
| Chemo-therapy (FINDLAY) | Churchill 31 | Gynaecology, Student's Handbook (HERMAN & MAXWELL) | Cassell 29 |
| Children, Diseases of (DINGWALL-FORDYCE) | Black 39 | Gynaecology, Text-book of (YOUNG) | Black 39 |
| Children, Diseases of (PEARSON & WYLLIE) | Churchill 31 | Hæmatology (PINEY) | Churchill 31 |
| Children, Diseases of (WILLIAMSON) | Livingstone 37 | Hair, The (O'DONOVAN) | Churchill 30 |
| Children, Sick (PATERSON) | Cassell 29 | Hand Infections (FITFIELD) | Lewis 33 |
| Children, Sick (THOMSON) | Oliver & Boyd xlv | Histology, Elementary Pathological (BARNARD) | Lewis 33 |
| Children, Sick, Nursing and Diseases of (MONCRIEFF) | Lewis 32 | Homœopathy in Practice (VOORHOEVE-NEATBY) <i>Homœopathic Publishing Co.</i> | 25 |
| Clinical Examination and Surgical Diagnosis (LEJARS) | Cape 28 | Human Biology and Racial Welfare (COWDRIY) | Lewis 32 |
| Clinical Methods (HUTCHISON & HUNTER) | Cassell 29 | Hydrology (GORDON & THOMSON) | Cape 28 |
| Club-foot (BROCKMAN) | Wright 41 | | |
| Colds, Common (HILL & CLEMENT) | Heinemann 36 | | |
| Consulting Hours, After (HOWARD) | Heinemann 36 | | |

| | PAGE | | PAGE |
|---|--------------------------------|--|---------------------------|
| Hygiene (CURRIE) | Livingstone 37 | Nasal Catarrh (STUART-LAW) .. . | Lewis 32 |
| Hygiene for Nurses (GUY & LINKLATER) .. . | Livingstone 37 | Nasal Sinusitis, Chronic (WATSON-WILLIAMS) .. . | Wright 49 |
| Hygiene and Public Health (HOSB) .. . | Scientific Publishing Co. 25 | Naval Hygiene (SHAW) .. . | Orf. Univ. Press 51 |
| Hygiene and Public Health (PARKES & KENWOOD) .. . | Lewis 32 | Nephritis (ALPORT) .. . | Helmanna 50 |
| Hygiene, Synopsis of (JAMESON & PARKINSON) .. . | Churchill 30 | Nervous Child (CAMERON) .. . | Orf. Univ. Press 51 |
| Infant Feeding (MYERS) .. . | Cape 28 | Nervous Indigestion (ALVAHED) .. . | Hedemour 50 |
| Infant Feeding in General Practice (BRAITHWAITE) .. . | Wright 42 | Nervous System (HAM) .. . | Ash 25 |
| Infants and Children, Diseases of (ALLEN) .. . | Baillière 27 | Nervous System (THOMSON & RIMMO) .. . | Cassell 29 |
| Infants and Children, Diseases of (REDDOCK) .. . | Homoeopathic Publishing Co. 25 | Nervous System, Clinical Examination of (MONRAD-KROHN) .. . | Lewis 32 |
| Infectious Diseases, Acute (ROLLESTON) .. . | Heinemann 56 | Nervous Temperament H.M. Stationery Office .. . | 35 |
| Infectious Diseases, Text-book (GOODALL) .. . | Lewis 52 | Neurology (BRAIN & STRAUSS) .. . | Churchill 31 |
| Joints, Injuries to (JONES) .. . | Orf. Univ. Press 34 | Nose and Throat (THOMPSON) .. . | Cassell 29 |
| Labour, Difficult (HERMAN) .. . | Cassell 29 | Nose, Throat, and Ear, Diseases of (TURNER) .. . | Wright 601 |
| Lady's Manual (REDDOCK) .. . | Homoeopathic Publishing Co. 25 | Obstetrics and Gynaecology (BOURNE) .. . | Churchill 51 |
| Lancashire Cotton Spinning Mills Sickness .. . | H.M. Stationery Office 35 | Ophthalmology (DUKE-ELDER) .. . | Churchill 31 |
| Larynx, Mechanism of (NEGUS) .. . | Heinemann 36 | Pathology, Morbid Anatomy, and Post-mortem Technique (MILLER) .. . | Black 39 |
| Life Assurance (BROCKBANK) .. . | Lewis 33 | Pathology for Students and Practitioners (KAUFMANN) .. . | Lewis 53 |
| Long Bones, Exposures of (HENRY) .. . | Wright xxiv | Pathology, Surgical (WAKELEY & JUNTUN) .. . | Wright xxiv |
| Lung and Pleura, Surgery of (DAVIES) .. . | Orf. Univ. Press 34 | Pathology, Surgical, and Morbid Anatomy (BOWLEY, ANDREWS, & KEYNES) .. . | Churchill 30 |
| Lunacy, Examination of (CROCKETT) .. . | Lewis 33 | Physical Signs in Clinical Surgery (BAILEY) .. . | Wright 41 |
| Lungs and Pleura, Diseases of (POWELL & HARTLEY) .. . | Lewis 32 | Physics, Manual of (CANDY) .. . | Cassell 29 |
| Marriage, Ideal (VAN DE VELDE) .. . | Heinemann 56 | Physiology (EVANS) .. . | Churchill 31 |
| Materia Medica (BRUCE & DILLING) .. . | Cassell 29 | Physiology, Applied (WRIGHT) .. . | Orf. Univ. Press 34 |
| Materia Medica (GHOSN) .. . | Scientific Publishing Co. 25 | Physiology, Human (WINTON & BAYLIS) .. . | Churchill 50 |
| Maternal Mortality and Morbidity .. . | H.M. Stationery Office 35 | Physiology, Synopsis of (SHORT & HAM) .. . | Wright 42 |
| Medical Diary .. . | Scott's Emulsion 151 | Plant Physiology, Recent Advances in (BARTON-WRIGHT) .. . | Churchill 31 |
| Medical History and Case-Taking (BOURNE) .. . | Livingstone 37 | Prescription Books .. . | Wright 150 |
| Medical Jurisprudence for India (LYON'S) .. . | Thacker 38 | Preventive Medicine (HASLAM) .. . | Churchill 31 |
| Medical Jurisprudence and Toxicology (GLAISTER) .. . | Livingstone 37 | Protozoology, Medical (KNOWLES) .. . | Thacker 38 |
| Medical Research Council Special Reports .. . | H.M. Stationery Office 35 | Psittacosis .. . | H.M. Stationery Office 35 |
| Medical Treatment (HUTCHINSON) .. . | Wright 164 | Psychiatry (DEVINE) .. . | Churchill 31 |
| Medical Treatment (YEO) .. . | Cassell 29 | Psychiatry, Text-book of (HENDERSON & GILLESPIE) .. . | Orf. Univ. Press 54 |
| Medicine, Elementary, in Terms of Physiology (JONES) .. . | Lewis 32 | Psychoneuroses, Study of (CULPIN) .. . | Churchill 51 |
| Medicine, Practice of (TAYLOR) .. . | Churchill 30 | Psychopathology (NICOLE) .. . | Baillière 27 |
| Medicine, Recent Advances (BEAUMONT & DODDS) .. . | Churchill 31 | Psychotherapy (MILLER) .. . | Cape 28 |
| Medicine, Synopsis of (TIDY) .. . | Wright 42 | Psychotherapy, Manual of (YELLOULEES) .. . | Black 39 |
| Medicine, Text-book of the Practice of (PRICE) .. . | Orf. Univ. Press 34 | Public Health Practice in the Tropics (KIRK) .. . | Churchill 59 |
| Mental Deficiency (TREDGOLD) .. . | Baillière 27 | Public Health Report 1929 (CHIEF M.O.H.) .. . | H.M. Stationery Office 35 |
| Midwifery (JELLETT & MADILL) .. . | Baillière 27 | Pulmonary Tuberculosis (BURELL) .. . | Churchill 51 |
| Midwifery and Gynaecology, Synopsis of (BOURNE) .. . | Wright 42 | Pyelography (ROCHE) .. . | Lewis 53 |
| Midwifery, Handbook of (BERKELEY) .. . | Cassell 29 | Radiography and Radiotherapeutics (KNOX) .. . | Black 39 |
| Midwifery, Handbook of (TOTTENHAM) .. . | Churchill 30 | Radiology (KERLEY) .. . | Churchill 31 |
| Midwifery, Lessons in (ANDERSON) .. . | Black 39 | Radium and Cancer (FITZWILLIAMS) .. . | Lewis 33 |
| Midwifery, Short Practice of (JELLETT) .. . | Churchill 30 | Radium, Medical Uses of .. . | H.M. Stationery Office 35 |
| Midwifery, Text-book of (AITKEN) .. . | Ash 23 | Radium and its Surgical Applications (SOULTAR) .. . | Heinemann 36 |
| Midwifery, Text-book of (JOHNSTONE) .. . | Black 39 | Radium Therapy (BIRKETT) .. . | Cassell 29 |
| Midwifery Wall Diagrams (BONNEY) .. . | Wright 19 | Refraction of the Eye (CLARKE) .. . | Baillière 23 |
| Mind and its Disorders (SPODART) .. . | Lewis 33 | Rheumatism (POYNTON & SCILLESNIER) .. . | Churchill 31 |
| Moorfields Eye Hospital (COLLINS) .. . | Lewis 33 | Rheumatoid Arthritis (DOUTHWAITE) .. . | Lewis 33 |
| Morphine Habit (SCOTT) .. . | Lewis 32 | Röntgen Therapy (VOLTZ) .. . | Orf. Univ. Press 34 |
| Muscles, Action of (MACKENZIE) .. . | Lewis 32 | School Child, Health of .. . | H.M. Stationery Office 35 |
| | | Skin, Common Diseases of (LOW) .. . | Oliver & Boyd xiv |

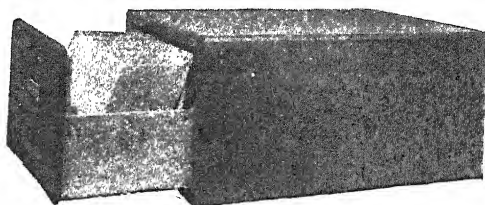
| | PAGE | | PAGE |
|--|------|---|------|
| Skin Complaints, Cosmetic Treatment of (KROMAYER) .. <i>Orf. Univ. Press</i> | 34 | Tropical Diseases (MANSON-BAHR) .. <i>Cassell</i> | 29 |
| Skin Therapy (HALLOIN-DAVIS) .. <i>Cape</i> | 28 | Tropical Diseases (STITT) .. <i>Lewis</i> | 33 |
| Slit-lamp Microscopy of the Living Eye (KOB) .. <i>Churchill</i> | 30 | Tropical Medicine (ROGERS) .. <i>Churchill</i> | 31 |
| Small-pox, Diagnosis of (RICKETTS & BYLES) .. <i>Cassell</i> | 29 | Tropical Midwifery: Labour-Room Clinics (GREEN-ARMYtage) .. <i>Thacker</i> | 38 |
| Spectacles, Prescribing of (PERIVIAL) .. <i>Wright</i> | 26 | Tropical Nursing (GREGG) .. <i>Cassell</i> | 29 |
| Stone and Calculous Disease of the Urinary Organs (JOLY) .. <i>Heinemann</i> | 36 | Tropical Ophthalmology (ELLIOT) .. <i>Orford Med. Publications</i> | xliv |
| Surgery (ROSE & CARLESS) .. <i>Baillière</i> | 27 | Tuberculosis (LAIRD) .. <i>Wright</i> | 25 |
| Surgery, Art of (SOUTAR) .. <i>Heinemann</i> | 36 | Tuberculosis of Bones and Joints in Children (FRASER) .. <i>Black</i> | 39 |
| Surgery, Emergency (BAILEY) .. <i>Wright</i> | 41 | Tuberculosis in Man and Lower Animals .. <i>H.M. Stationery Office</i> | 35 |
| Surgery, Faith and Science in (BLAND-SUTTON) .. <i>Heinemann</i> | 36 | Tuberculosis for Nurses (UNDERWOOD) .. <i>Livingstone</i> | 37 |
| Surgery, Minor (FIELD) .. <i>Lewis</i> | 33 | Tumours, Innocent and Malignant (BLAND-SUTTON) .. <i>Cassell</i> | 29 |
| Surgery, Minor, and Bandaging (WILLIAMS) .. <i>Churchill</i> | 30 | Tumours, Pathology of (KETTLER) .. <i>Lewis</i> | 32 |
| Surgery, Modern Operative (CARSON) .. <i>Cassell</i> | 29 | Ultra-violet Radiations and Their Uses (AITKEN) .. <i>Oliver & Boyd</i> | xlv |
| Surgery, Recent Advances in (OGILVIE) .. <i>Churchill</i> | 31 | Ultra-violet Radiotherapy (RUSSELL) .. <i>Cape</i> | 28 |
| Surgery, Science and Practice of (ROMANIS & MITCHNER) .. <i>Churchill</i> | 30 | Ultra-violet Rays in the Treatment and Cure of Disease (HALL) .. <i>Heinemann</i> | 36 |
| Surgery, Shorter (LOVE) .. <i>Lewis</i> | 32 | Urinary Tract in Children (BEER & HYMAN) .. <i>Heinemann</i> | 36 |
| Surgery, Stepping Stones to (RAWLING) .. <i>Lewis</i> | 32 | | |
| Surgery, Synopsis of (GROVES) .. <i>Wright</i> | 42 | | |
| Surgery, System of (CHOYCE) .. <i>Cassell</i> | 29 | | |
| Surgical Case, Diet and Care of (BOYD) .. <i>Lewis</i> | 32 | Vade Mecum (RUDDOCK) .. <i>Homeopathic Publishing Co.</i> | 25 |
| Surgical Emergencies (ROMANIS & MITCHNER) .. <i>Churchill</i> | 30 | Varicose Veins, Injection Treatment (DOUTH-WAITE) .. <i>Lewis</i> | 33 |
| Surgical Handicraft, Pye's (CARSON) .. <i>Wright</i> | 41 | Venereal Diseases (LEES) .. <i>Livingstone</i> | 7 |
| Surgical Operations, Student's Handbook (TREVES & WAKELEY) .. <i>Cassell</i> | 29 | Veterinary Dictionary (MILLER) .. <i>Black</i> | 39 |
| Symptomatology, Index of (TIDY) .. <i>Wright</i> | 40 | Visceropitosis (BEDDINGFIELD) .. <i>Orf. Univ. Press</i> | 34 |
| | | Visiting Lists .. <i>Wright</i> | 17 |
| Therapeutics (CAMPBELL) .. <i>Livingstone</i> | 37 | Water Pollution Reports .. <i>H.M. Stationery Office</i> | 35 |
| Through the States with a Seeing Eye (BERRY) .. <i>Wright</i> | 97 | X-ray Diagnosis (REDDING) .. <i>Cassell</i> | 29 |
| Tongue Diseases (SPENCER & CADE) .. <i>Lewis</i> | 33 | X-rays, General Practice and (KNOX) .. <i>Black</i> | 39 |
| Treatment, Dictionary of (WHITLA) .. <i>Baillière</i> | 22 | | |

PERIODICALS.

| | PAGE |
|--|-------------------------------|
| Bristol Medico-Chirurgical Journal | Arrowsmith 48 |
| British Journal of Surgery | Wright 44 |
| British Journal of Tuberculosis | Baillière 46 |
| British Journal of Urology | Constable 51 |
| Cancer Review, The | Wright 43 |
| Homeopathic World | Homeopathic Publishing Co. 25 |
| Indian Journal of Medical Research | Thacker 38 |
| Indian Medical Gazette | Thacker 38 |
| Irish Journal of Medical Science | 50 |
| Lancet, The | Lancet Offices 45 |
| Medical Directory, 1931 | Churchill 30 |
| Medical Officer, The | 49 |
| Medical Press and Circular | 47 |
| Prescriber, The | 24 |

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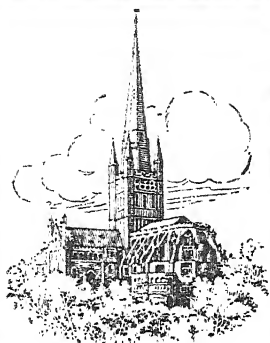
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| African Life Assurance Society, Ltd., River Plate House, Finsbury Circus, E.C.2. <i>Sec.</i> , M. B. Massey-Hicks, F.I.S.A. | 1904 | 49/- | 67/3 | 96/7 | *4,000,509 |
| Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. <i>Gen. Man.</i> , A. Levine P | 1824 | 49/1 | 65/1 | 90/10 | 21,793,132 |
| Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. <i>Gen. Man.</i> , C. H. Falloon. <i>Act. and Life Man.</i> , William Penman P | 1808 | 48/1 | 63/7 | 88/4 | 6,648,968 |
| Australian Mutual Provident Society, 73-76, King William St., E.C.4. <i>Man. for U.K.</i> , D. E. Walker M | 1849 | 48/2 | 64/5 | 89/10 | 76,779,055 |
| Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. <i>Chairman</i> , Jno A. Jefferson, F.I.A. <i>Sec.</i> , J. M. Laing, F.I.A., F.F.A. <i>Further particulars see opposite page</i> P | 1866 | 47/9 | 64/- | 91/1 | 18,000,000 |
| British Equitable Assurance Co. Ltd., Eastern Entrance, Royal Exchange, E.C.3. <i>Man.</i> , Douglas A. Coleman P | 1854 | 48/8 | 64/11 | 91/9 | 1,658,250 |
| British General Insurance Co. Ltd., 66, Cheapside, E.C.2. <i>Man. Dir.</i> , Norman M. Walker P | 1904 | 49/5 | 64/10 | 90/7 | 731,585 |
| †British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. <i>Joint Gen. Mans.</i> , Robert J. Jamieson and F. E. Crabtree P | 1902 | — | — | — | 510,208 |
| Caledonian Insurance Co., 19, George St., Edinburgh. <i>Gen. Man.</i> , F. J. Cameron, F.F.A., F.I.A., London (City) Office, 5, Lothbury, E.C.2 P | 1805 | 43/5 | 64/6 | 90/7 | 6,483,847 |
| Canada Life Assurance Co., 2, St. James's Square, S.W.1. <i>Man.</i> , J. R. Wandless, F.I.A. P | 1847 | 48/5 | 65/4 | 94/2 | *30,968,732 |
| Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William St., E.C.4. <i>Gen. Man. and Act.</i> , A. D. Besant. P | 1824 | 47/6 | 65/2 | 94/10 | 10,215,644 |
| Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. <i>Man.</i> , Ernest A. Cawdon. <i>Sec.</i> , J. S. Gillespie M | 1873 | 48/9 | 65/1 | 89/10 | 12,301,989 |
| Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. <i>Act.</i> , A. G. Allen P | 1861 | 46/3 | 63/3 | 93/2 | 17,430,064 |
| Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. <i>Man.</i> , G. T. Varney. P | 1871 | 48/6 | 65/2 | 94/2 | 15,297,673 |
| Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones M | 1867 | 47/4 | 63/1 | 90/1 | 4,251,464 |
| Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St., E.C.2; Life Dept., 32, Moorgate, E.C.2. <i>Man. Dir.</i> , Sir Edward M. Mountain, Bart., J.P. P | 1807 | 48/1 | 63/10 | 89/5 | 15,247,263 |
| Equitable Life Assurance Society, 19, Coleman Street, E.C.2. <i>Act. and Man.</i> , W. Palin Elderton, F.I.A. M | 1762 | 54/- | 68/- | 92/- | 6,890,013 |
| Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. and Sec.</i> , A. C. Thorne, F.I.A. P | 1844 | 48/10 | 64/6 | 90/9 | 8,704,234 |

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| General Life Assurance Company, General Buildings, Aldwych, W.C.2. Man. and Act., J. Mayhew Allen. P | 1837 | 49/2 | 64/11 | 91/3 | 2,524,405 |
| Gresham Life Assurance Society Ltd., 188-190, Fleet St., E.C.4. Gen. Man., Alex. Lawson .. P | 1848 | 47/6 | 62/10 | 88/6 | 7,861,199 |
| Guardian Assurance Co. Ltd., 68, King William St., and 21, Fleet Street, E.C. Gen. Man., Geo. W. Reynolds. Sec., A. G. Sweet, Act., W. A. Osborne P | 1821 | 48/10 | 64/6 | 89/3 | 6,352,302 |
| Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. Sec., J. Stirling .. P | 1806 | 48/4 | 64/- | 89/10 | 10,932,110 |
| Legal & General Assurance Society Ltd., 10, Fleet St., E.C. Gen. Man., W. A. Workman, F.I.A. P | 1836 | — | — | — | 19,496,312 |
| Life Association of Scotland, 82, Princes St., Edinburgh. Man. and Act., R. M. M. Roddick. Sec., Alex. Prentice. London, 29, Bishopsgate, E.C. Sec., G. S. N. Carter .. P | 1838 | 48/11 | 64/10 | 91/1 | 6,880,434 |
| Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. Gen. Man., Robert M'Connell. London Office, 1, Cornhill, E.C.3 P | 1836 | 49/10 | 65/9 | 91/3 | 9,014,045 |
| London & Scottish Assurance Corporation Ltd., King William Street House, Arthur Street, E.C.4. Man., Frank B. Cooke. Sec., A. G. H. Emslie. Act., Harold Dougharty .. P | 1862 | 48/9 | 64/9 | 91/2 | 4,753,070 |
| London Assurance, The, 1, King William St., E.C. Man. of Life Dept. & Act., A. G. Hemming, F.I.A. P | 1720 | 49/- | 64/8 | 90/2 | 5,901,966 |
| London Life Association Ltd., 81, King William St., E.C.4. Act. and Man., H. M. Trouncer, M.A., F.I.A. .. M | 1806 | 45/3 | 59/- | 82/- | 21,058,385 |
| Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. Act. and Sec., Howard T. Cross, F.I.A. .. M | 1852 | 48/10 | 65/- | 91/6 | 3,475,860 |
| Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. Man. and Sec., Bertram Sutton, F.C.I.I. .. M | 1884 | 40/2 | 55/3 | 80/- | 278,738 |
| Motor Union Insurance Co. Ltd., 10, St. James's St., S.W.1. Gen. Man., W. A. Hurst. Act., Walter Denham, F.F.A., F.I.A. .. P | 1907 | 48/9 | 64/11 | 91/6 | 318,645 |
| Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Effingham Ho., 1, Arundel St., W.C. Man., Alex. S. Sellar, M.A., F.F.A. .. P | 1886 | 48/9 | 65/3 | 89/9 | 17,706,356 |
| National Mutual Life Assurance Society, 39, King St., Cheapside, E.C. Gen. Man., G. Marks, C.B.E., F.I.A. Act. and Sec., G. H. Recknell, F.I.A., F.F.A. .. M | 1830 | 48/4 | 63/7 | 89/6 | 5,112,890 |
| National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C.2. Man., H. W. Meyers .. M | 1869 | 46/8 | 61/6 | 87/2 | 33,000,000 |
| National Provident Institution, 48, Gracechurch St., E.C.3. Act. and Sec., H. E. Melville, F.I.A. M | 1835 | 50/2 | 66/3 | 91/1 | 10,382,180 |
| North British & Mercantile Insurance Co. Ltd., 61, Threadneedle St., E.C.2 and 64, Princes St., Edinburgh. Man. Dir., London, Sir A. Worley, Bt., C.B.E. Man., Edinburgh, H. J. Stevenson, W.S. P | 1809 | 49/10 | 66/1 | 91/11 | 28,552,262 |
| Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. Gen. Man., K. K. Peters .. P | 1836 | 49/- | 64/8 | 90/10 | 6,659,402 |
| Norwich Union Life Insurance Society, Norwich. Gen. Man. and Act., M. Mackenzie Lees, F.F.A. Sec., H. G. Wilton, F.I.A. London, 49, Fleet St., E.C.4. Further particulars see page 14 .. M | 1808 | 51/9 | 66/6 | 92/5 | 31,936,599 |
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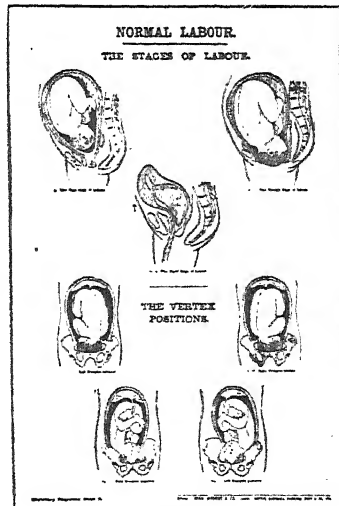
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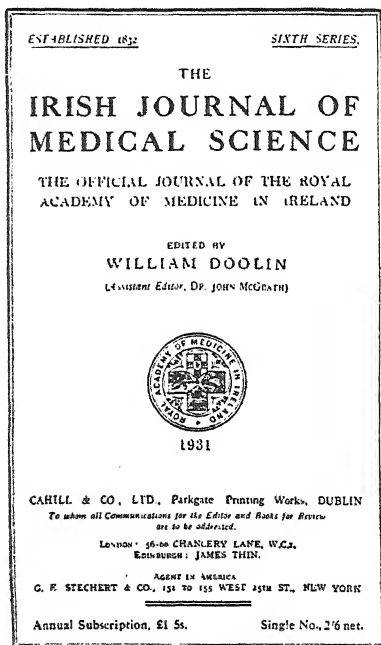
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RAPHAEL JACKSON (Major), Secretary

UNIVERSITY OF BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental Department affords the necessary instruction for the Degrees and Diploma of the University and of other examining bodies in that subject.

The University confers the following Degrees and Diplomas :

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| BACHELOR OF MEDICINE AND BACHELOR OF SURGERY | M.B., Ch.B. |
| MASTER OF SURGERY | Ch.M. |
| DOCTOR OF MEDICINE | M.D. |
| DOCTOR OF PHILOSOPHY | Ph.D. |
| BACHELOR OF DENTAL SURGERY | B.D.S. |
| MASTER OF DENTAL SURGERY | M.D.S. |
| DIPLOMA IN DENTAL SURGERY | L.D.S. |
| DIPLOMA IN PUBLIC HEALTH | D.P.H. |

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 648 beds. The Bristol Royal Hospital for Sick Children and Women (100 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, the Bristol City Fever Hospital and, by the kind permission of the Health Committee of the Bristol City Council, Southmead Infirmary are also open for the clinical instruction of students.

SCHOLARSHIPS.—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Four House Surgeons, one Casualty House Surgeon, two House Physicians, one House Physician for Cancer Research Wards, one Resident Obstetric Officer, one Ophthalmic and Gynaecological House Surgeon; one Ear, Nose and Throat House Surgeon; one Assistant to the Senior Resident Medical Officer, who also acts as House Surgeon, and House Surgeon to the Skin Department; and one Dental House Surgeon.

At the Bristol General Hospital.—Senior Resident Medical Officer; one Casualty House Surgeon; two House Physicians; two House Surgeons; one Resident Obstetric Officer; one House Surgeon for Special Departments; one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

UNIVERSITY OF EDINBURGH

Principal—Sir T. H. HOLLAND, K.C.I.E., K.C.S.I., LL.D., F.R.S.

The SUMMER SESSION, 1931, opens on April 21st, and closes on July 3rd.
The WINTER SESSION, 1931-32, opens the second week in October.

FACULTY OF MEDICINE.

Dean—PROFESSOR J. LORRAIN SMITH, M.A., M.D., LL.D., F.R.S.

The Faculty embraces 18 Professors and 80 Lecturers, and attached to these there are about 40 Assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.:

PROFESSORS:

Chemistry—George Barger, D.Sc., F.R.S.
Zoology—J. H. Ashworth, D.Sc., F.R.S.
Botany—Wm. Wright Smith, M.A., F.R.S.
Anatomy—Arthur Robinson, M.D. [F.R.S.
Physiology—Sir E. Sharpey-Schaefer, LL.D., F.R.S.
Materia Medica—Alfred J. Clark, M.C., M.D., F.R.C.P.
Pathology—J. Lorrain Smith, M.D., LL.D.
Bacteriology—Thomas Jones Mackie, M.D.
Forensic Medicine—Sidney A. Smith, M.D., D.P.H. [C.M.G., F.R.C.S.
Public Health—Percy Samuel Leleann, C.B.

Medicine—W. T. Ritchie, M.D.
Surgery—D. P. D. Wilkie, M.D., Ch.M.
Midwifery and Gynaecology—R. W. Johnstone, M.A., M.D.
Clinical Surgery—John Fraser, Ch.M., M.D.
Clinical Medicine—Edwin Bramwell, M.D., W. T. Ritchie, M.D., and D. Murray Lyon, M.D.
Tuberculosis—Sir Robert W. Philip, M.D.
Therapeutics—David Murray Lyon, M.D.
Psychiatry—George M. Robertson, M.D.

LECTURERS:

Anatomy—E. B. Jamieson, M.D.
Applied Anatomy—F. H. Jardine, M.B.
Histology—May L. Cameron, M.B., M.Sc., M.B.
Biochemistry—(Vacant)
Biophysics—H. Dyer, Ph.D.
Physiology of the Nervous System—A. Ninian Bruce, M.D., D.Sc.
Experimental Pharmacology—(Vacant).
Materia Medica—C. M. Scott, M.B., Ph.D.
Pathology—Theodore Rettie, D.Sc.; W. G. Miller, M.B.
Morbid Anatomy—J. Davidson, M.B. [Alston M.B.
Bacteriology—G. S. McLachlan, M.B.; J. M. Phisps—G. A. Carse, M.A., D.Sc.
Chemistry—Edgar Stedman, B.Sc., Ph.D.
Tropical Diseases—Lt.-Col. E. D. W. Greig, C.I.E., M.D.
Medical Entomology and Parasitology—J. H. Ashworth, D.Sc., F.R.S.; A. E. Cameron, M.A., D.Sc.; E. W. M. Cameron, D.Sc.
Tropical Hygiene—J. du P. Langrishe, D.S.O., M.B., B.Ch. (conjointly with Professor).

Sanitary Administration—(Vacant)
Clinical Instruction in Infectious Fevers—Alexander James, M.D.; W. T. Benson, M.D. [M.D.
History of Medicine—J. D. Comrie, M.A., B.Sc.
Surgical Pathology—K. Paterson Brown, M.B.
Veneral Diseases—David Lees, D.S.O., M.B.
Psychology—James Drever, M.A., B.Sc., D.Phil.
Radiology—J. M. Woodburn Morrison, M.D., D.M.R.E.
Neuro-Pathology—F. E. Reynolds, M.B.
Psychiatry—Wm. McAlister, M.B.
Clinical Experimental Methods—(Vacant).
Clinical Midwifery—R. W. Johnstone, M.D.; James Young, M.D.; H. S. Davidson, M.B.; Douglas Miller, M.D.; W. F. T. Haultain, M.B.; E. C. Fahmy, M.B.; John Storrock, M.B.; Clifford Kennedy, M.B.
Clinical Instruction in Diseases of Children—Mas. McNeil, M.D.; N. S. Carmichael, M.D., Ch.B.; H. F. Thatcher, M.D.; Gertrude Herzfeld, M.D.; Norman Dott, M.B.

CLINICAL TEACHING STAFF,

Clinical Surgery—Geo. L. Chiene, M.B.; W. J. Stuart, M.B.; J. W. Struthers, M.B.; D. P. D. Wilkie, M.D., Ch.M.; Henry Wade, M.D.; John Fraser, M.D., Ch.M.; J. M. Graham, Ch.M.
Clinical Medicine—D. Chalmers Watson, M.D.; Edwin Bramwell, M.D.; Edwin Mathew, M.D.; W. T. Ritchie, M.D.; John Eason, M.D.; D. Murray Lyon, M.D.; J. D. Comrie, M.D.; Alex. Goodall, M.D.
Clinical Gynaecology—R. W. Johnstone, M.D.; H. S. Davidson, M.B.; James Young, M.D.;

ROYAL INFIRMARY:

W. F. T. Haultain, M.B.; Douglas Miller, M.D.; E. C. Fahmy, M.B.
Diseases of the Larynx, Ear and Nose—John S. Fraser, M.B.; J. D. Lithgow, M.B.; W. T. Gardiner, M.B.; G. Ewart Martin, M.B.
Diseases of the Skin—Frederick Gardiner, M.D.; B. Craston Low, M.D.; Robert Aitken, M.D.; G. H. Percival, M.B., Ph.D.
Diseases of the Eye—A. H. H. Sinclair, M.D.; H. M. Traquair, M.D.; B. H. Cameron, M.B.; C. W. Graham, M.B.

Practical Instruction is afforded, under the superintendence of the Professors, in Laboratories with the necessary appliances, and in Tutorial and Practical Classes connected with the above Chairs, and opportunities are afforded to Students to extend their practical knowledge and engage in original research. Opportunities for Hospital Practice are afforded at the Royal Infirmary, the Hospital for Sick Children, Maternity Hospital, the City Fever Hospital, and the Royal Edinburgh Hospital for Mental Diseases. Upwards of 250 beds are available for the Clinical Instruction of Students of the University. Four Degrees in Medicine and Surgery are conferred by the Univ. of Edinburgh, viz.: Bachelor of Med. (M.B.), Bachelor of Surg. (Ch.B.), Doctor of Med. (M.D.), and Master of Surg. (Ch.M.). The minimum Class Fees for M.B. and Ch.B., including Hospital Fee (£12), amount to about £260, and the Matric. and Exam. Fees to £47 15s. 6d. An additional Fee of £21 is payable by those who proceed to M.D., and £21 by those who proceed to Ch.M. The annual value of the Bursaries, Prizes, Scholarships, and Fellowships in the Faculty of Med. amounts to about £3,600, and that of the other Bursaries, etc., tenable by Students of Med., amounts to about £1,850.

POST-GRADUATE INSTRUCTION.—Courses of instruction are given for the University Diplomas in Public Health, Tropical Medicine and Hygiene, Psychiatry, and Radiology. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University. Courses of instruction for the Diploma in Tropical Veterinary Medicine are also given. This Diploma is open to those holding an approved veterinary qualification registrable by the Royal College of Veterinary Surgeons. The University also takes part in the Courses and Examinations held in the auspices of the Edinburgh Post-Graduate Courses in Medicine. In the departments of the Faculty of Medicine, provision is made for research by students of graduate standing.

In the University Laboratories facilities will be provided for candidates for the Degree of Ph.D., whose applications to engage in research have been accepted by the Senatus.

A Syllabus and further information as to Matriculation, the Curricula of Study for Degrees, etc., may be obtained from the Dean of the Faculty of Medicine; and for Degrees in the Faculties of Arts, Science, Divinity, Law, and Music, from the Deans of these Faculties; or from the Secretary; and full details are given in the University Calendar, published by James Thin, 55, South Bridge, Edinburgh. Price by post, 6s. By Authority of the Senatus, W. A. FLEMING, Secretary.

October, 1930.

UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE.

The WINTER SESSION commenced on October 2nd.
The Laboratories and Museums afford every facility to Students and Graduates for Practical Instruction as well as for Original Research.

SCOPE OF INSTRUCTION.

Complete Courses of Instruction are offered for the Examinations of the University of Manchester, and also for the Examinations of other Examining Bodies in the United Kingdom. In the Dental Department Complete Courses are given preparing for the Degrees and Diploma in Dentistry granted by the University, as well as for the Diploma of the Royal College of Surgeons of England, and other Dental Diplomas. The Public Health Laboratories are situated at a short distance from the University. The fullest opportunities are offered to Graduates and others in preparation for the Diplomas in Public Health, Bacteriology, Psychological Medicine and Veterinary State Medicine, and for Special Certificates in School Hygiene and Factory Hygiene. Post-graduate Courses are held in various Branches of Medicine and Surgery, information of which can be obtained from the Dean of the Medical School.

OPPORTUNITIES FOR CLINICAL STUDY—ROYAL INFIRMARY & OTHER HOSPITALS.

The Clinical Instruction is given in the new Royal Infirmary, opened in 1909 on a site near to the Medical School. It is provided with every modern requirement for the treatment of the sick and the investigation of disease. Instruction in Special Subjects is given in other Hospitals associated with the University. A large number of beds in the General and in the Special Hospitals are available, thus affording unrivalled opportunities for Clinical Study.

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| 1. The Manchester Royal Infirmary .. 668 Beds | 6. Fever Hospital for Infectious Diseases about 800 Beds |
| 2. The St. Mary's Hospitals for Women and Children about 316 Beds | 7. Special Hospitals for Diseases of the Ear, Throat and Chest, Skin, and the Christie Cancer Hospital about 252 Beds |
| 3. Manchester Children's Hospital .. 190 Beds | 8. Dental Hospital of Manchester |
| 4. Manchester Royal Eye Hospital .. 148 Beds | 9. Anabats Hospital 142 Beds |
| 5. Manchester Northern Hospital for Women and Children 73 Beds | 10. Salford Royal Hospital 283 Beds |

Hospital Appointments.—In consequence of the large number of Hospitals associated with, or in the vicinity of, the University, exceptional opportunities are offered to Graduates to obtain Resident Hospital Appointments.

Scholarships, Exhibitions and Prizes.—Two Open Entrance Scholarships, for Graduates, each of the value of not more than 120 guineas, are offered yearly in July. In addition, the Dreschfeld Scholarship of £30 per annum, the John Russell Medical Entrance Scholarship, £45 per ann., and other Entrance Scholarships of the value of £30 to £50 a year for two or three years, are also tenable in the Medical Faculty.

Fellowships, Scholarships, &c., are also offered for Competition to Students of the Faculty.

Residence for Undergraduates.—There are Halls of Residence both for Men and for Women Students. Lodgings can also be recommended. Full information can be obtained from the Dean of the Medical School.

University of St. Andrews

(SCOTLAND).

Chancellor—The Rt. Hon. STANLEY BALDWIN, M.P., P.C., LL.D.

Rector—SIR WILFRED THOMASON GRENFELL, K.C.M.G., M.D., F.R.C.S.

Vice-Chancellor and Principal—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., F.R.S.

FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following DEGREES AND DIPLOMAS—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., L.D.S., D.P.D. (all open to men or women).

SESSION 1930-1931 opened 3rd October, 1930. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

CLINICAL INSTRUCTION at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

BURSARY (Scholarship) Competitions. June annually. Entries due 5th May.

RESIDENTIAL ENTRANCE SCHOLARSHIPS FOR MEN. Five or six of £100 competed for in June. Medical Students are eligible.

FEES for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182. Fees for L.D.S., £88 10s.; Fee for D.P.D., £25.

PRELIMINARY EXAMINATION. September and March. Entries due 12th August and 10th February.

PRE-REGISTRATION EXAMINATION. (Physics and Chemistry) September, December, and June. Entries due 31st August, 5th November, 5th May.

RESIDENCE HALLS for Men and Women at St. Andrews; for Women at Dundee.

Provision made for POST-GRADUATE STUDY AND RESEARCH.

Full information may be obtained from the SECRETARY OF THE UNIVERSITY, 71 North Street, St. Andrews; or, the DEAN OF THE FACULTY OF MEDICINE, Westlands, St. Andrews.

THE UNIVERSITY OF LIVERPOOL

FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Orthopaedic Surgery, Dental Surgery, and Veterinary Science, also degree of Doctor of Philosophy, and Diplomas in Public Health, Tropical Medicine, Tropical Hygiene, Veterinary Hygiene, Medical Radiology and Electrolgy, and a Licence in Dental Surgery. Students may also prepare in the University for the examinations of other licensing bodies.

Medical School Buildings.—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Bio-chemistry, Tropical Medicine, Physiology, Comparative Pathology, Pathology, Bacteriology, Hygiene, and Cytology.

Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals; the Eye and Ear Infirmary, the Hospital for Women (including the Samaritan Hospital), the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and Liverpool Maternity Hospital. These hospitals contain in all a total of over 1500 beds.

Fellowships and Scholarships.—Fellowships, Scholarships, and prizes of over £1000 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

*The following Prospectuses may be obtained on application to the Registrar:—*Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.

WALTER J. DILLING, M.B., Ch.B.

UNIVERSITY of ABERDEEN

Founded
1494.

FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. The Degree of Ph.D. is also granted in this Faculty. They are conferred after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred (after Examination) on Graduates in Medicine of the University of Aberdeen, or of any University whose medical degrees are recognized as qualifying for registration by the General Medical Council of the United Kingdom. The Faculty of Medicine embraces thirteen chairs, and instruction is given in all departments of Medical Science.

Practical Classes are conducted by the Professors, Lecturers, and Assistants in Laboratories furnished with all necessary appliances: and facilities are afforded to Students and Graduates to extend their practical knowledge and to engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, the Royal Hospital for Sick Children, the City (Fever) Hospital, the General Dispensary, Maternity Hospital, Vaccine Institutions, Ophthalmic Institutions, and the Royal Mental Hospital.

Bursaries, Scholarships, Fellowships and Prizes, to the number of 50 and of the Annual Value of £1200, may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is approximately £242.

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary, and full particulars will be found in the University Calendar published by the Aberdeen University Press Ltd.

H. J. BUTCHART, Secretary.

Royal College of Surgeons of Edinburgh

(INCORPORATED 1505.)

Copies of the Regulations for the Fellowship, Licence, Higher Dental Diploma, and Licence in Dental Surgery, with dates of Examinations, may be had on application to—

MR. DAVID THOMSON,

49 GEORGE SQUARE, EDINBURGH, Clerk of the College.

Medical and Dental Students must state date of Registration.

ROTUNDA HOSPITAL DUBLIN.

UPWARDS of 2,000 maternity cases and 1,000 gynaecological intern patients are treated in the Hospital during the year. Besides the Hospital there is an extern Maternity Department with over 2,000 cases. The routine for Students consists of attendance at the Morning Lectures on Midwifery and Gynaecology, examination of patients in the Gynaecological Department, attendance at operations and all abnormal labour in the Hospital Wards, and conduction of labour cases in the intern and extern departments.

In addition there is a large antenatal clinic and an Infants' department where students are encouraged to attend. The Pathological Laboratory is open to the Class, and the X-Ray plant adds greatly to the Hospital.

Qualified Students are given facilities for following and observing all abnormal cases in the hospital or district, and are allowed, so far as possible, to assist at gynaecological operations.

The Hospital Courses are always going on during the year, and Students can join at any time. The class is limited, therefore it is advisable to register in advance. Board and lodging can be obtained in the Hospital, where the living quarters are extremely comfortable.

Extra classes in gynaecological diagnosis and operative midwifery are conducted by the Assistants to the Master.

FEES: One month, £6 6s.; months other than the first, £4 4s. Three months, £12 12s. I.M. Course, £21.

The L.M. Certificate is given to fully qualified Practitioners of Medicine on examination after six months' attendance at the Hospital.

FULL PARTICULARS FROM—

BETHEL SOLOMONS, M.D., F.R.C.P.I., MASTER, ROTUNDA HOSPITAL.

SCHOOL OF MEDICINE

OF

The Royal Colleges, EDINBURGH.

(FOUNDED 1505.)

SUMMER SESSION, 1931, opens 21st APRIL.

WINTER SESSION, 1931-32, opens 7th OCTOBER.

THE Lectures qualify for the English and Scottish Universities and other Medical Examining Boards.

One half of the Qualifying Classes required for graduation in the University of Edinburgh may be attended in this School.

The School offers a large choice of Teachers upon the various subjects comprised in the Medical Curriculum.

The Calendar of the School, giving all necessary information regarding Classes, Fees, and Examinations, will be published on September 15th; a copy may be obtained (price 6d., postage 2½d.) on application to the—

DEAN OF THE SCHOOL, SURGEONS' HALL, EDINBURGH.

UNIVERSITY OF LONDON
OPHTHALMIC HOSPITAL MEDICAL SCHOOL
ROYAL LONDON OPHTHALMIC HOSPITAL
(Moorfields Eye Hospital), CITY ROAD, E.C.1.

Qualified Medical Practitioners and Registered Medical Students may enter on the practice of the Royal London Ophthalmic Hospital (Moorfields) at any time, and are on certain conditions eligible for appointment as Chief Clinical Assistant, Clinical Assistant, and Junior Assistant.

Courses of Instruction, extending over a period of five months, begin in OCTOBER and MARCH:

1. PRACTICAL REFRACTION CLASSES.
2. METHODS OF EXAMINATION AND USE OF THE OPHTHALMOSCOPIC.
3. LECTURES every afternoon on the following subjects:—(a) ANATOMY, including EMBRYOLOGY and NORMAL HISTOLOGY; (b) PHYSIOLOGY; (c) OPTICS including PHYSIOLOGICAL OPTICS; (d) PATHOLOGY AND BACTERIOLOGY; (e) OPHTHALMIC MEDICINE AND SURGERY, consisting of: MEDICAL OPHTHALMOLOGY, EXTERNAL DISEASES OF THE EYE, MOTOR ANOMALIES AND SQUINT, DISEASES OF THE RETINA AND OPTIC NERVE, DISEASES OF THE UVEAL TRACT.
4. OPHTHALMOSCOPIC CONDITIONS: A Practical Class with Demonstrations each week at 5 P.M.
5. CLINICAL LECTURES.
6. OCCASIONAL LECTURES on subjects allied to Ophthalmology.
7. OPERATIVE SURGERY. In these classes the usual operations are performed by the student upon pigs' eyes.
8. PRACTICAL PATHOLOGY. A Course of Demonstrations on the Normal and Morbid Histology of the Eye is given by the Pathologist in the Laboratory.
9. PRACTICAL BACTERIOLOGY.
10. CLASSES IN RADIOGRAPHY.
11. PHYSICO-THERAPY (ULTRA-VIOLET LIGHT DIATHERMY, ETC.)
12. SLIT-LAMP MICROSCOPY.

FEES.—A composition fee of 35 Guineas will admit Students at once to all the lectures and classes (except the classes on Physico-Therapy, Slit-Lamp Microscopy, and the Examination Fee).

DIPLOMA IN OPHTHALMIC MEDICINE & SURGERY & OTHER DEGREES IN OPHTHALMOLOGY.

The above complete curriculum is specially designed to meet the requirements of candidates entering for these examinations.

FEES FOR THE PRACTICE OF THE HOSPITAL:

Perpetual - £5 5 0; Three to Six Months - £3 3 0; Two Months - £2 2 0; One Month - £1 1 0
Clinical work begins at 9 a.m. daily. Operations are performed between 10 a.m. and 1 p.m.
For further particulars apply to the SECRETARY to the Medical School, at the Royal London Ophthalmic Hospital, City Road, E.C.1.; or to the Dean, CHARLES GOULDEN, O.B.E., M.D., M.CH., F.R.C.S.

North-East London Post-Graduate College

PRINCE OF WALES'S GENERAL HOSPITAL,
TOTTENHAM, N.15

THE clinical facilities of the Hospital are reserved for post-graduates.
Special Intensive Courses at various periods during the year.

FEES

For the Hospital Practice in general Medicine or Surgery the fee is 5 guineas for three months or 2 guineas for one month. Provided there is accommodation in the special departments, the fees are: Eye Department 3 guineas, Gynaecological Department 5 guineas, Ear, Nose and Throat Department 5 guineas for 3 months. All Departments the fee is 3 guineas for one month, 6 guineas for 3 months, 10 guineas for a year, and 15 guineas for a perpetual ticket.

For further information apply to THE DEAN.

THE ROYAL NATIONAL HOSPITAL

For CONSUMPTION AND DISEASES OF THE CHEST.

VENTNOR, ISLE OF WIGHT.

For early-stage cases, Open-air Treatment is afforded under the most advantageous conditions in the Undercliff of the Isle of Wight. Artificial pneumothorax, surgical treatment, and radiographic examination included without extra charge.

Terms £2 a week; with a governor's Letter of Recommendation.

Further particulars may be obtained from the Secretary:

R. N. H. C., 18, Buckingham Street, Strand, W.C.2.

UNIVERSITY OF BIRMINGHAM

FACULTY OF MEDICINE. (Associated with the General, Queen's and Special Hospitals for Clinical Teaching.)

The University grants Degrees in Medicine, Surgery and Public Health, and a Diploma in Public Health; also Degrees and a Diploma in Dental Surgery.

The courses of instruction are also adapted to meet the requirements of other Universities and Licensing Bodies.

SCHOLARSHIPS, EXHIBITIONS AND PRIZES.

Entrance and other Scholarships and Exhibitions, and various Prizes and Medals are awarded annually in the Faculty of Medicine.

SCHOOL OF DENTISTRY (University of Birmingham and Birmingham Dental Hospital)

The School of Dentistry, in conjunction with the General and Queen's Hospitals, affords a complete curriculum for the Dental Diplomas and Dental Degrees of the University and all other Licensing Bodies. There is a Dental Scholarship of the value of £46 17 6 offered annually.

RESIDENCE FOR UNDERGRADUATES AND OTHER STUDENTS.

There are Halls of Residence for Men and for Women Students. A Register of approved lodgings is also kept by the Secretary of the University.

For Syllabus and further information apply to Prof. J. C. BRASH, M.A., M.D., Dean.

Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home, Oswestry

OPEN AIR WARDS.

Station: GOBOWEN (G.W.R.).

PRIVATE WARDS 5 Gns. per week, exclusive of Surgeon's fees, but inclusive of X rays, splints, plasters, massage, and gymnasium.

A limited number of beds are available in the GENERAL WARDS at 2½ Gns. per week, inclusive.

For particulars, apply to THE SECRETARY-SUPERINTENDENT.

The LONDON FOOT HOSPITAL

33, FITZROY SQUARE, LONDON, W.1.

Patron: HIS GRACE THE DUKE OF PORTLAND, K.G., P.C., G.C.V.O.

Chairman of the Committee: SIR A. HENRY McMAHON, G.C.M.G., G.C.V.O., K.C.I.E., C.S.I.

Treasurer: A. W. OXFORD, M.D.

Bankers: THE MIDLAND BANK LIMITED, 159/160, TOTTENHAM COURT ROAD, LONDON, W.1.

DEVOTED EXCLUSIVELY to the CARE OF THE POOR who are FOOT AFFLICTED.

In a quiet way more misery is caused by pain connected with the feet than by graver forms of disease. Over 13,000 patients were treated in 1930, and many more ought to be reached and relieved, were funds available.

The vast majority are breadwinners, whose capacity for labour is lessened by foot defects. If they go lame, their living and homes are in jeopardy. The Hospital relieves solely upon Voluntary Contributions. All the workers give their services free. Subscriptions and donations will be gratefully received by the Hon. Treasurer at the Hospital.

LONDON FEVER HOSPITAL

ISLINGTON, N.1.

The only Hospital of its kind in or around London NOT RATE SUPPORTED.

DISEASES TREATED are SCARLET FEVER, DIPHTHERIA, MEASLES and GERMAN MEASLES in the GENERAL WARDS, these and other INFECTIOUS DISEASES in PRIVATE ROOMS.

General Ward Fees—Children, 2 guineas; Adults, 3 guineas per week.

Private Rooms—7 and 10 guineas per week.

Medical Practitioners may visit cases sent in by them. Ambulance sent on receipt of Telephone message (Clerkenwell 9786).

HERBERT J. SAY, Sec.

PLAISTOW HOSPITAL, LONDON, E.13.

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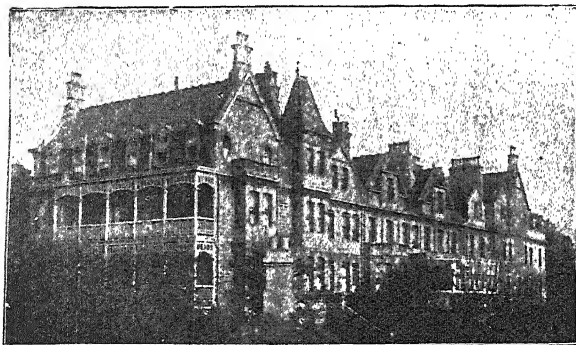
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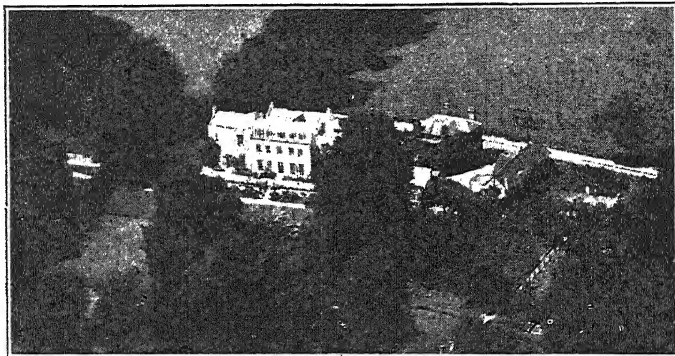
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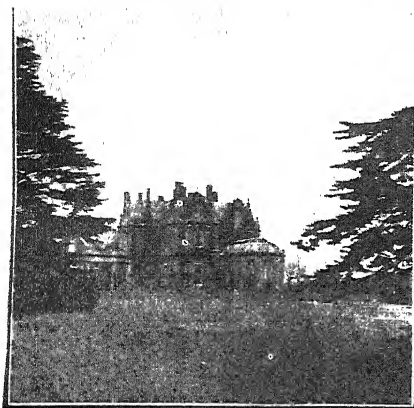


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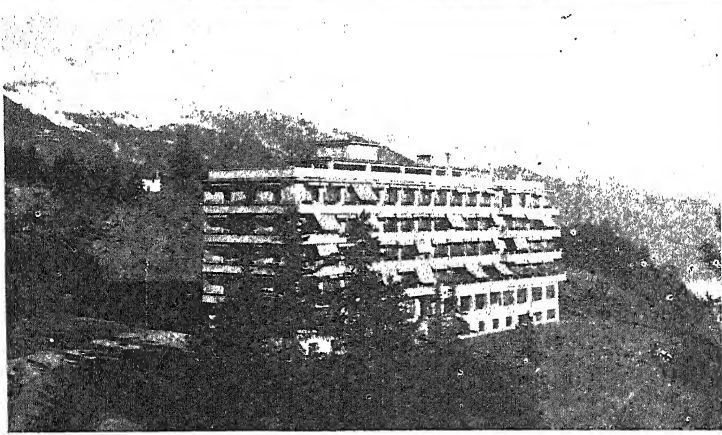
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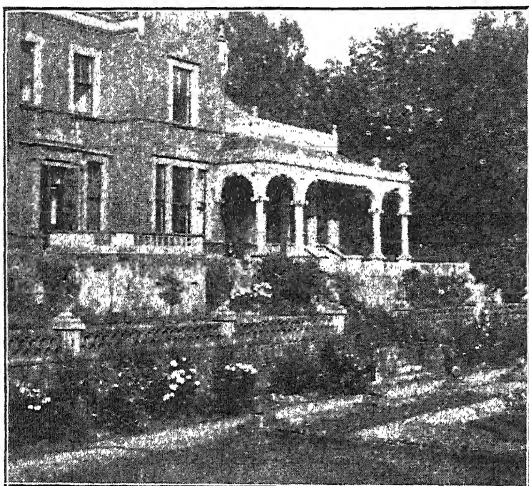
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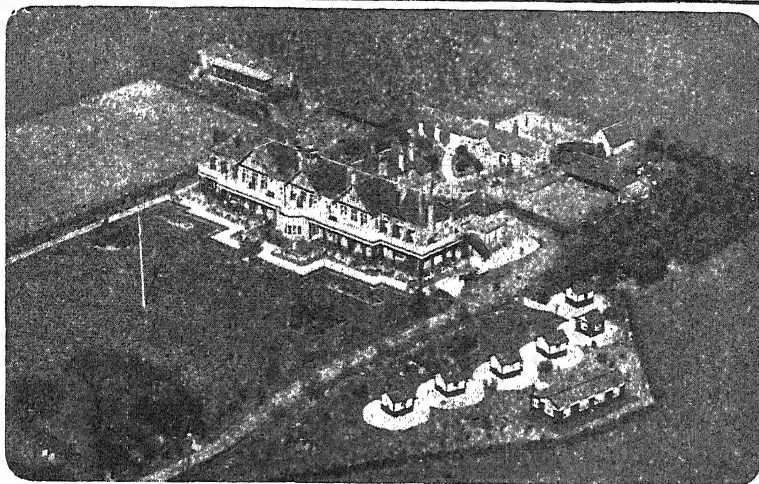
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£100 will name a cot at the Sanatorium.

£50 will support a child for a year.

£5 will clothe a child for a year.

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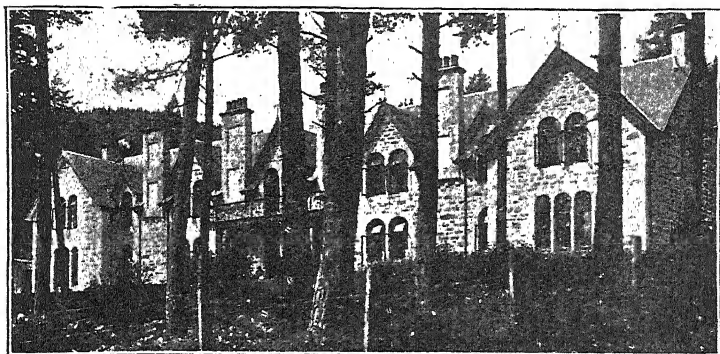
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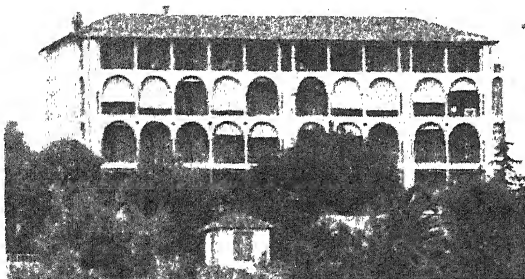
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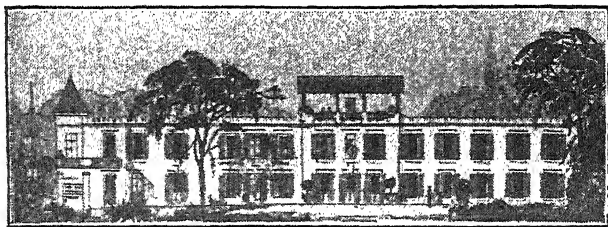
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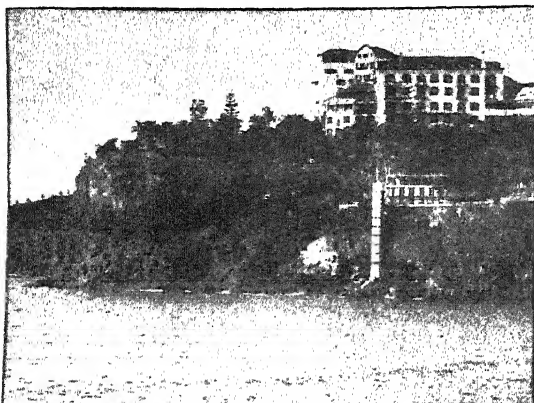
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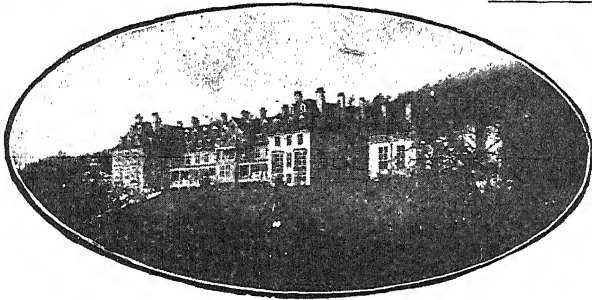
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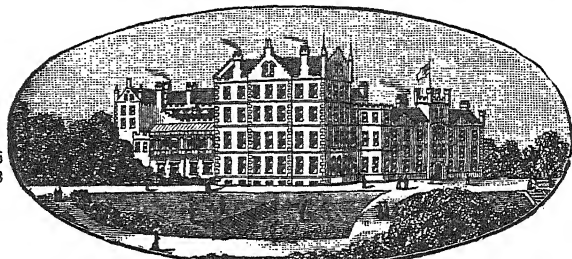
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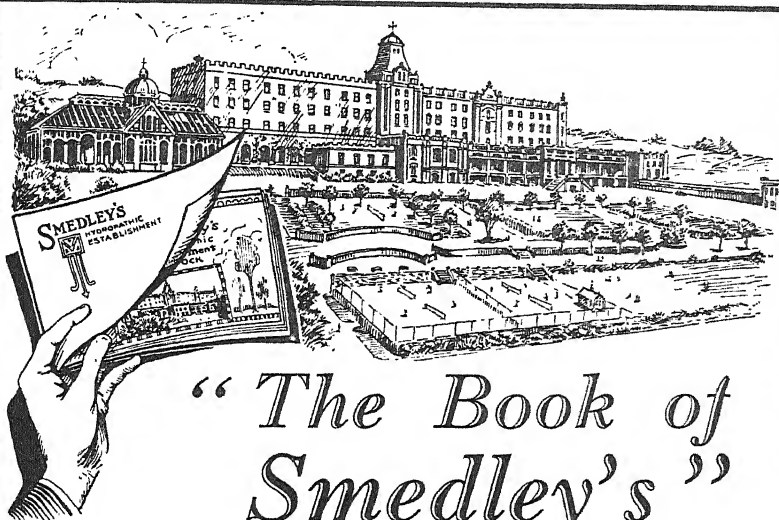
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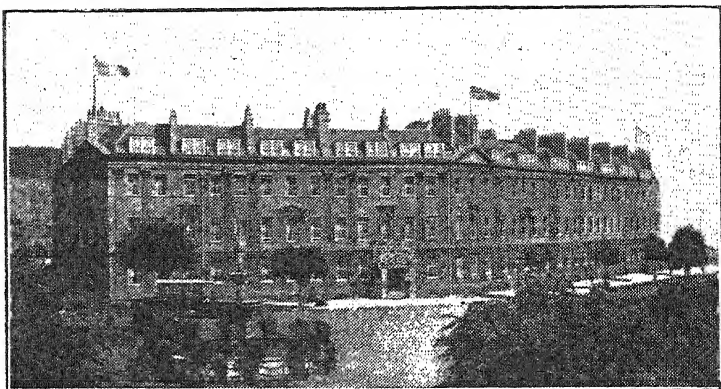
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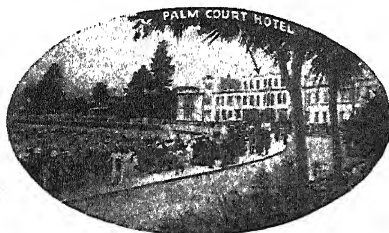
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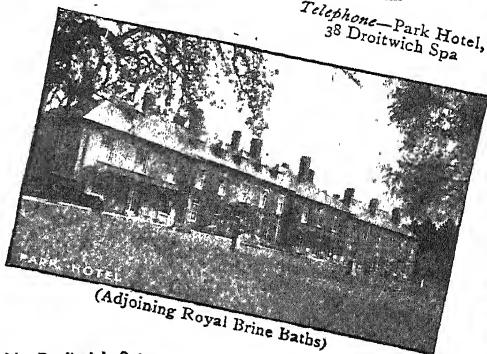
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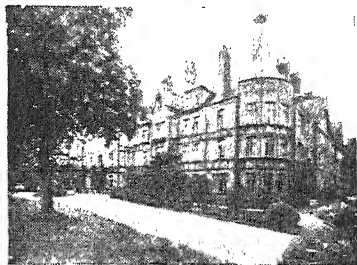
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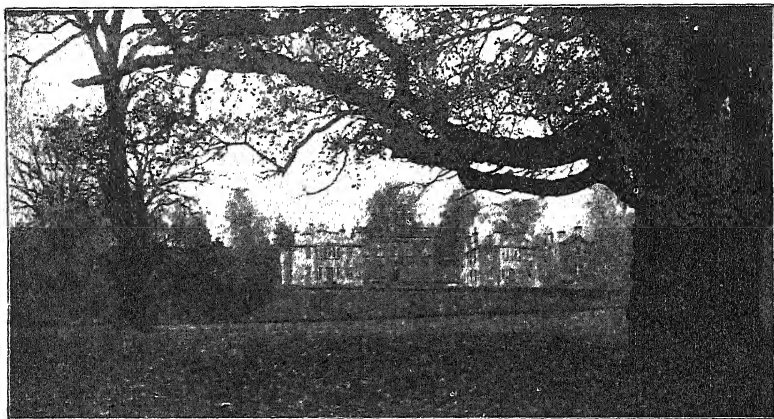
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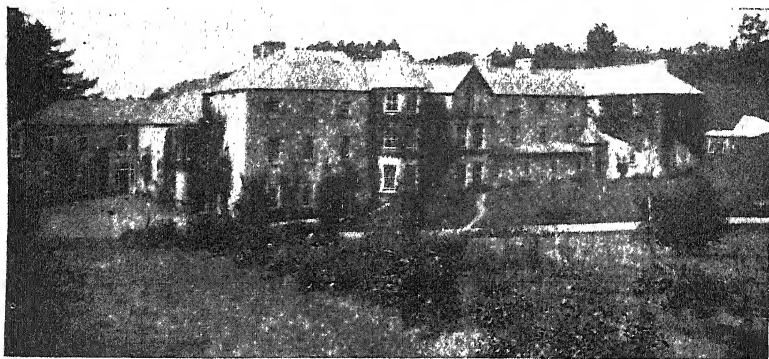
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A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT OF NERVOUS AND MENTAL DISORDERS EITHER VOLUNTARILY OR UNDER CERTIFICATE.

HAYDOCK LODGE is a large Country Mansion especially adapted for the Care and Treatment of Persons with Nervous and Mental Disorders, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered Park, Gardens, and Farm of 300 acres, with provision and facilities for Tennis, Cricket, Football, Bowls, Croquet and Golf.

Newton-le-Willows is a first-class station on the L. M. & S. Ry. (midway between Liverpool and Manchester), where conveyances are always to be had.

Motors are kept for the use of Patients, and those whose condition will allow and whose friends desire it, spend some time annually at the seaside. Voluntary Boarders are received without Certificate, written application for admittance being all that is required.

Haydock Lodge has also associated with it an establishment at **GRETA BANK** (for ladies only), in the Craven district of Yorkshire, near Ingleton.

TERMS, PROSPECTUS AND INFORMATION may be obtained on application to the Medical Superintendent.

Consultations can be arranged by appointment.

Resident Medical Licensee.....J. C. WOOTTON, L.R.C.P.Lond., M.R.C.S.Eng.

Medical Superintendent.....F. M. SEAL, M.B., M.R.C.S., L.R.C.P.

THE LAWN, LINCOLN.

A Registered Hospital founded in 1819 for the Care and Treatment of Private Patients and Voluntary Boarders suffering from Mental and Nervous Disorders, including post-encephalitic conditions in adults.

THE Hospital combines the advantages of town and country, a maximum of fresh air and sunshine being afforded by its situation in large gardens on the southern slope of the hill near the Cathedral, while the centre of the town is within easy access. Open-air treatment is provided on a glass-roofed verandah permeable to ultra-violet rays, and special facilities for Psychotherapy are offered to suitable and co-operative Patients.

FOR TERMS AND PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

CITY MENTAL HOSPITAL PORTSMOUTH.

Accommodation is provided for Ladies and Gentlemen in Two Detached Villas, at a charge from **3 guineas** upwards, including all necessities except clothing.

APPLY - MEDICAL SUPERINTENDENT.

CAMBERWELL HOUSE

33, PECKHAM ROAD, LONDON, S.E.5.

Telegrams :
"Psycholia, London."

For the Treatment of
MENTAL DISORDERS

Telephone :
Rodney 4731-2.

ALSO completely Detached Villas for mild cases with private suites if desired. Voluntary patients received. Twenty acres of grounds. Hard and Grass Tennis Courts, Bowls, Croquet, Squash Racquets, and all indoor amusements including Wireless and other Concerts. Occupational Therapy, Physical Drill and Dancing Classes. X-ray and Actino Therapy, Prolonged Immersion Baths, Operating Theatre, Dental Surgery and Ophthalmic Department. Chapel.

Senior Physician: Dr. HUBERT JAMES NORMAN,
assisted by three Medical Officers, also Resident and Visiting Pathologist.

An Illustrated Prospectus may be obtained upon application to the Secretary.

HOVE VILLA, BRIGHTON—Convalescent Branch of the above.

Telephone : HOUNSLOW 0158.

WYKE HOUSE

ISLEWORTH, MIDDLESEX.

A Private
Mental Hospital
for Ladies and
— Gentlemen.

Conveniently situated in quiet rural surroundings in Syon Lane,
about a quarter of a mile to the north of the new Great West Road.

Stations: OSTERLEY (District Railway); ISLEWORTH (Southern Railway).

For Terms and Further Particulars apply to the Resident Physician:—

G. W. SMITH, O.B.E., M.B., Ch.B. (Edin.)

Consulting Rooms : 57 GROSVENOR STREET, W.1. (By Appointment).

PECKHAM HOUSE

112, Peckham Road, LONDON, S.E.15.

Telegrams : "ALLEVIATED, LONDON." Telephone : Rodney 4741, 4742.

THE above House, which was established in 1826, is an **INSTITUTION FOR THE CARE AND TREATMENT OF PERSONS SUFFERING FROM MENTAL DISEASES AND NERVOUS DISORDERS.** Both certified patients and Voluntary Boarders are received. Separate houses for the treatment and accommodation of special cases adjoin the Institution. There is a Seaside Branch, Kearsney Court, near Dover, to which patients may be sent for treatment or on holiday. Motor and carriage exercise is provided as required. Patients can avail themselves of a course of physical drill. Tennis courts. Entertainments, dances, and indoor amusements held throughout the year.

Illustrated Prospectus and further particulars can be obtained from the **MEDICAL SUPT.**

CITY OF LONDON MENTAL HOSPITAL,

Near DARTFORD, KENT.

Under the management of a Committee of the Corporation of the City of London.

PRIVATE PATIENTS RECEIVED WITH OR WITHOUT CERTIFICATION. The minimum **WEEKLY CHARGE** is **TWO Guineas.** An Illustrated Booklet giving full particulars can be obtained from the **MEDICAL SUPERINTENDENT.**

The Institution is within two miles of Dartford Station, on the Southern Railway, with frequent electric train service, and is about 16 miles from London. Trams and Motor Omnibuses pass the door.

Telephone : DARTFORD 57.

Telegraphic Address : **STONE HOUSE, DARTFORD, KENT.**

DERBY MENTAL HOSPITAL

ALBANY HOUSE, a Detached Block for FEMALE PRIVATE PATIENTS.

TERMS: 2 GUINEAS PER WEEK and upwards. This Villa is distinct from the main building, and has separate recreation grounds.

For further particulars, apply to the Medical Superintendent,

DR. JOHN BAIN, ROWDITCH, DERBY.

THE GRANGE, Near Rotherham

A SANATORIUM OF THE HIGHEST CLASS FOR THE

CARE & CURE OF MENTAL INVALIDS (Ladies).

Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.,
Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. Slade, Mus. Bac., late Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at 342 Glossop Road, Sheffield, by appointment.

GRANGE LANE STATION (L. & N.E. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham changing at Tinsley.

FOR TERMS, FORMS, &C., APPLY TO THE RESIDENT PHYSICIAN.

Shaftesbury House,

FORMBY-BY-THE-SEA.

Telephone: No. 8 FORMBY.

Near LIVERPOOL.

THIS HOUSE, specially built and licensed for the Care and Treatment of a limited number of LADIES and GENTLEMEN suffering from

MENTAL or NERVOUS BREAKDOWN,

is delightfully situated between Liverpool and Southport in well-wooded grounds. Outdoor and indoor amusements and occupation provided. Voluntary Boarders received. Psycho-Therapy in suitable cases if desired.

TERMS MODERATE.

Apply RESIDENT PHYSICIAN.

SPRINGFIELD HOUSE

Near BEDFORD

Telephone No. 3417

For Mental Cases, with or without Certificates

Ordinary Terms, Five Guineas per week
(including Separate Bedrooms for all suitable Cases, without extra charge.) :: ::

For forms of admission, etc., apply to the Resident Physician, CEDRIC W. BOWER, as above, or at 5, DUCHESS STREET, PORTLAND PLACE, W.I., on Tuesdays, from 4 p.m. to 5 p.m.

The Old Manor, Salisbury

Telephone 51

**A PRIVATE HOSPITAL FOR THE CARE AND
TREATMENT OF THOSE OF BOTH SEXES
SUFFERING FROM MENTAL DISORDERS.**

Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate.

Convalescent Home at Bournemouth

standing in 12 acres of Ornamental Grounds, with Tennis Courts, etc. Patients or Boarders may visit the above, by arrangement, for long or short periods.

Illustrated Brochure on application to the Med. Supt., The Old Manor, Ltd., Salisbury.

CLARENCE LODGE

CLARENCE ROAD, CLAPHAM PARK, S.W.4.

A LIMITED number of LADIES suffering from MENTAL and NERVOUS DISORDERS are received for treatment under a Specialist. The House stands in large grounds. Telephone: Brixton 0494

For further particulars see Illustrated Prospectus from Resident Licensee: Miss THWAITES.

EAST SUSSEX COUNTY MENTAL HOSPITAL

Accommodation is provided for Private Patients resident in the County. The Estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for children. For particulars apply to:—

The Resident Physician and Medical Supt., The Hospital, HELINGLY.

ASHWOOD HOUSE,

KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.), $3\frac{1}{2}$ miles; Dudley (L.M. & S.R.), 4 miles; Wolverhampton (G.W.R. or L.M. & S.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

FARNHAM HOUSE & MARYVILLE

FINGLAS, Co. DUBLIN.

PRIVATE HOSPITALS for MENTAL AND NERVOUS ILLNESS, including the ALLIED DISORDERS OF ALCOHOLISM and THE DRUG HABIT.

IDEALLY situated within two miles of the City and in a health-inducing district. Voluntary boarders received without medical certificates.

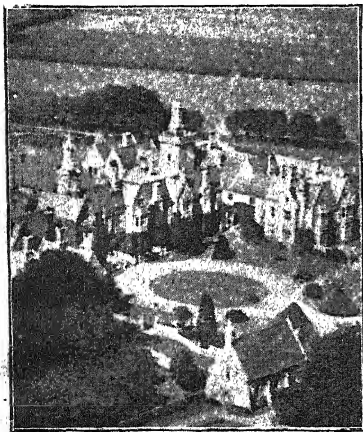
A beautiful seaside residence in a park of 600 acres, with a private bathing beach, is available for suitable cases.

Experienced staff; modern treatment. Interviews can be arranged at 42, FITZWILLIAM PLACE, DUBLIN.

Apply: H. R. C. RUTHERFORD, F.R.C.S.I., D.P.H.,

PHONE: FINGLAS II.

Medical Superintendent.



COTON HILL

Mental Hospital

Near STAFFORD.

Chairman of the Committee of Management:

THE RIGHT HONOURABLE

THE EARL OF DARTMOUTH.

Beautifully situated in a high and healthy position, with extensive grounds. The hospital is devoted to the care and treatment of the mentally afflicted of the upper and middle classes. Voluntary patients are received. Terms on application. Private rooms with special attendants, can be arranged.

For further particulars, apply to—

Dr. R. MACDONALD, O.B.E., M.D., D.P.M.

Telephone: Stafford 14.

BAILBROOK HOUSE, BATH

For the Care and Treatment of
Ladies & Gentlemen suffering from
~ Nervous or Mental Breakdown. ~

Special Attention is given to the Curative Treatment of Early Cases,
also to Fresh Air Treatment and Occupational Therapy.

Apply S. J. GILFILLAN, O.B.E., M.B., *Resident Physician.*

Telephone : BATHEASTON 8189.

VOLUNTARY PATIENTS RECEIVED

Trams to Bathford pass the entrance gates of Bailbrook House.

Inclusive Terms from 5 Guineas per week.

PLYMPTON HOUSE

PLYMPTON, DEVON

ESTABLISHED 1834

PLYMPTON HOUSE is licensed for the accommodation of both sexes,
and is well adapted by its position and appointments for the Medical
Treatment and Care of Patients of the Upper and Middle Classes, suffering
from MENTAL DISEASE.

TERMS ON APPLICATION.

Letters and Telegrams :

Telephone: No. 2 PLYMPTON.

DR. J. C. NIXON, PLYMPTON

PRIVATE MENTAL HOSPITALS CO. DUBLIN.

HAMPSTEAD, Glasnevin, for Gentlemen.—HIGHFIELD, Drumcondra, for Ladies

For the Cure and Care of Patients of the Upper Class suffering from
Mental and Nervous Diseases and Abuse of Drugs.

Telephone: Drumcondra No. 3.

Telegrams: "Eustace," Glasnevin.

**These Hospitals are built on the Villa System, and there are also
Cottages on the demesne (130 acres), which is 150 ft. above the sea level
and commands an extensive view of the Dublin Mountains and Bay.**

Voluntary Patients admitted without Medical Certificates.

For further information apply for illustrated prospectus, etc., to the Resident Medical
Superintendent: DR. WILLIAM NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41,
Grafton Street, Dublin. *Telephone: Dublin No. 1224.* On Mondays, Wednesdays, and Fridays,
at 2.30 p.m.

THE MOAT HOUSE, TAMWORTH, STAFFS.

Established 1816. For the TREATMENT of a few LADIES suffering
from NERVOUS and MENTAL DISORDERS. Voluntary Patients received

For Terms apply to THE RESIDENT MEDICAL ATTENDANT.

Telephone . 108 Tamworth,

BARNWOOD HOUSE

GLOUCESTER

A REGISTERED HOSPITAL for the CARE and TREATMENT of LADIES and GENTLEMEN suffering from NERVOUS and MENTAL DISORDERS.

WITHIN two miles of the G.W.R. and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by Rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Boarders of both sexes are also received for Treatment.

Special accommodation for LADY VOLUNTARY BOARDERS is also provided at the MANOR HOUSE, which has its own private grounds and is entirely separate from the main Hospital.

For particulars as to Terms, etc., apply to **ARTHUR TOWNSEND, M.D.,**
Telephone: No. 7 BARNWOOD. *Resident Superintendent.*

THE FLOWER HOUSE BECKENHAM LANE, S.E.6

Telephone: LEE GREEN 1038

8 miles from London;

A PRIVATE HOME of the highest class for *Gentlemen* suffering from Mental and Nervous Disorders, both under certificates or as *Voluntary Boarders*.

A beautifully furnished old Family Mansion thoroughly modernized and up to date.

Twenty-five acres of well-timbered grounds, containing unrivalled flower gardens, cricket and football fields, croquet, tennis and bowls.

Billiards room, Private Theatre, and Wireless.

Special suites for suitable patients. In new annex, consisting of private sitting room, bed room, attendant's room (if necessary) and private bath room and lavatory.

Station, BECKENHAM HILL, 5 minutes, and Beckenham Junct.

Tram 54 from Victoria to Southend Village, which is 2 minutes' walk from Flower House.

Motor Buses 54, 47, 536.



For terms and further particulars, apply
W. F. UMNEY, M.D., Medical Superintendent, or
Mrs. A. BECKETT, Resident Licensee.

THE MENTAL HOSPITAL

DIGBYS, near EXETER.

The above Hospital, situated in healthy country, three miles from Exeter, RECEIVES PRIVATE PATIENTS OF BOTH SEXES.

FEES: TWO GUINEAS
per week.

Particulars on application to the
MEDICAL SUPERINTENDENT.

Newlands House

TOOTING BEC COMMON,
 LONDON, S.W.17.

Private Mental Hospital

FOR LADIES & GENTLEMEN.

Telephone:
STREATHAM 0524.

UPLANDS

A Large Detached Villa, in connection with the Cheshire County Mental Hospital, Macclesfield, for the RECEPTION OF PRIVATE PATIENTS of both sexes. FEES from £1 18s. 6d. upwards, according to accommodation.

Apply for Prospectus to

H. DOVE CORMAC, M.B., M.S., D.P.M., Medical Superintendent.

Telephone: Macclesfield 17.

FENSTANTON

CHRISTCHURCH ROAD, STREATHAM HILL, S.W.2.

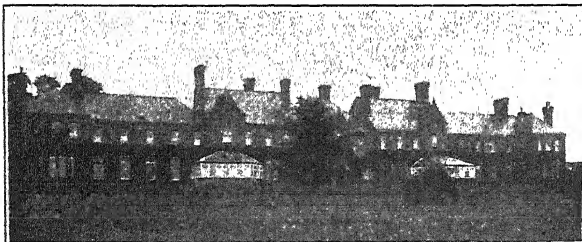
Telephone: STREATHAM 8430.

A Private Hospital for the Care and Treatment of Ladies suffering from Mental and Nervous Disorders.

The Mansion, with Annexe, stands on an elevated site in 12½ acres of well wooded grounds. Special facilities for Voluntary Patients in Mansion. Visits by own Medical Attendant encouraged.

For Terms apply - J. H. EARLS, M.D., Resident Physician.

LEIGH HOUSE, HATTON, WARWICK.



**FOR THE
TREATMENT
OF MENTAL
DISEASES
IN
LADIES**

Terms from 2½ guineas per week.

APPLY MEDICAL SUPERINTENDENT.

ST. ANDREW'S PRIVATE ASYLUM STIRCHES, HAWICK

ONLY CATHOLIC ASYLUM IN SCOTLAND.

Under the management of the Sisters of St. Augustine.
CHAPLAIN IN RESIDENCE. MENTAL SPECIALIST
IN ATTENDANCE.

Apply: THE REV. MOTHER SUPERIOR.

ST. ALBANS, HERTS.

(20 miles from London.)

Ladies suffering from all forms of MENTAL ILLNESS received for treatment at the Herts County Mental Hospital, Hill End. Convalescent and mild cases can be treated in a delightful country mansion, with extensive grounds, known as

"HIGHFIELD HALL"

situate about a mile away from the Hospital.

Fees 2 and 3 Guineas weekly.

Particulars from the MEDICAL SUPT.

TUE BROOK VILLA, Liverpool

**A PRIVATE HOME for the Care and Treatment of
Ladies and Gentlemen suffering from Mental Disorder.**

PLEASANTLY SITUATED in about 20 acres of grounds, within easy reach of the City of Liverpool. All kinds of outdoor and indoor amusements. VOLUNTARY BOARDERS ALSO RECEIVED.

For Terms, etc., apply to the Resident Proprietor—

J. M. MOYES, M.B., Ch.B., D.P.M.

BARNSLEY HALL, BROMSGROVE, WORCESTERSHIRE.

PPRIVATE Mental Patients of both sexes are received in connection with the Worcestershire Mental Hospital. Extensive private grounds in the beautiful Lickey District.

Terms, 35s. WEEKLY.

For further particulars and necessary forms apply to the Medical Superintendent.

The SILVER BIRCHES, Church Street, EPSOM.

This Home has been established over 60 years for the Care and Treatment of Ladies suffering from Mental Ailments.

TERMS, etc., on application to—

Miss M. O. DANIEL, *Res. Licensee*, or to Dr. E. C. DANIEL, *Co-Licensee*.

Telephone: 346 Epsom.

WYE HOUSE, BUXTON.

A PRIVATE HOME

For Ladies and Gentlemen suffering from Nervous and Mental Disorders.

Both Certified and Voluntary Patients received.

The House, with grounds of 10 acres, is situated 1200 ft. above sea level, and commands extensive views of the surrounding country.

Terms from 3½ guineas per week.

Resident Physician: W. W. HORTON, M.D.

Tel. 130 BUXTON,

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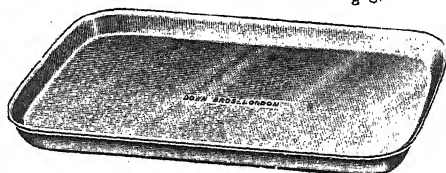
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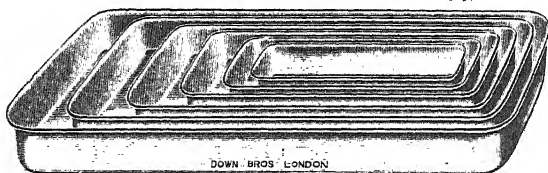
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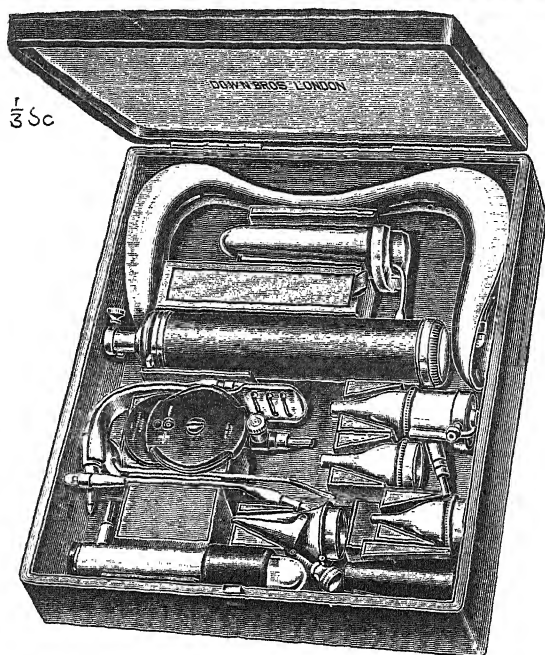
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Auriscopes with 3 Specula

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With battery-carrying handle
With regulating rheostat and spare lamps

In Leather-covered Case ... £13 : 5 : 0

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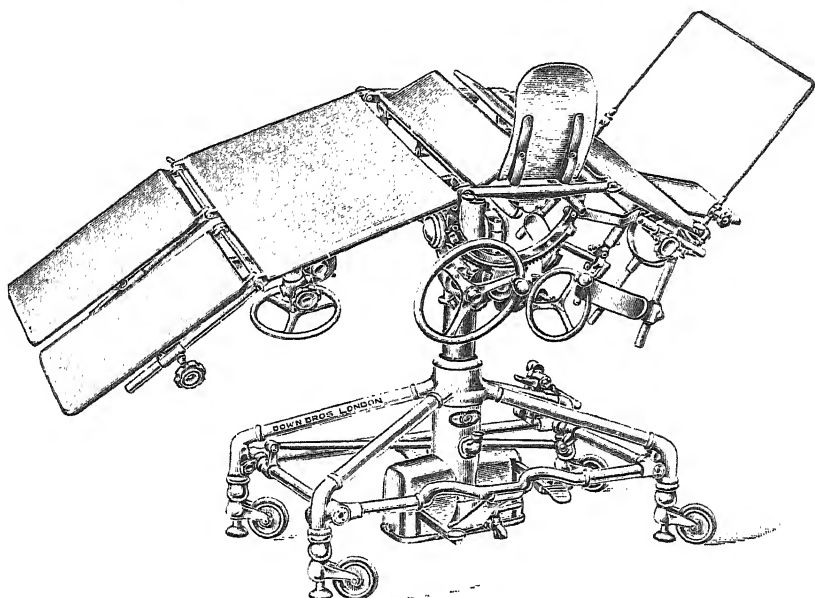
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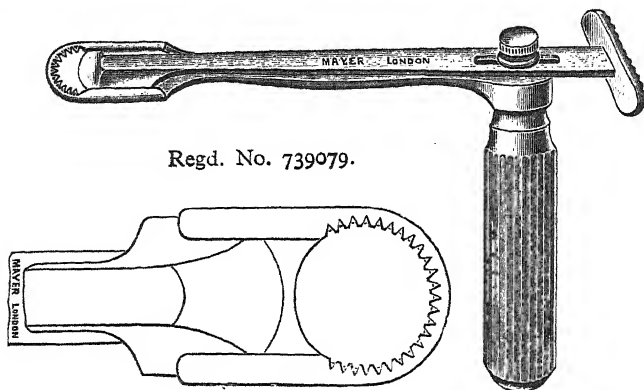
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Regd. No. 739079.

The Non-skid Guillotine Head devised by Mr. O. Popper has a serrated edge which fixes the tonsil and becomes the fulcrum around which the tonsil is rotated. Thus inversion through the guillotine is certain and easy, even when the tonsil is flat, buried or fibrous. The tonsil cannot slip back after inversion.

The Heath Guillotine fitted with Popper Head makes an ideal instrument for Tonsil Enucleation; it makes the operation easy in "difficult" cases.

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Made in 3 sizes

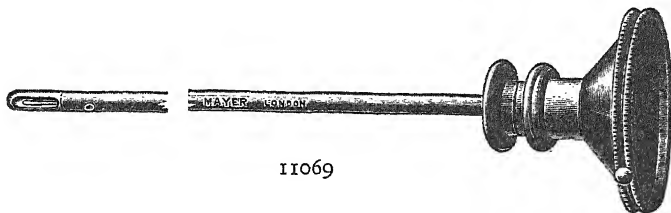
Each **£2 : 7 : 6**

*Lists of new instruments
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A NEW ENDO-RHINOSCOPE AFTER HOLMES

Made at the suggestion of Dr. P. WATSON-WILLIAMS and shown at the meeting of the Laryngological section of the Royal Society of Medicine, May 3, 1929.



This Endo-Rhinoscope, modelled on Holmes' Salpingoscope, is intended for the inspection of the nasal passages and choanæ rather than the naso-pharynx. It affords an excellent *upright view* of the regions under inspection; it gives a very *wide field* and shows the details clearly and in *true colour*. Having a straight tip it is more easily introduced and enables it to be passed into the maxillary antrum for examining the interior of that cavity.

"With the instrument passed through the right nasal passage a definite



Endo-Rhinoscopic image, as seen in a case of right antral sinusitis (Dr. P. Watson-Williams' case).

stream of muco-pus was seen escaping from the right middle meatus, passing outwards and downwards, and forming a sign characteristic of antral discharge. The diagnosis was subsequently confirmed by the suction syringe before the sinus was opened and drained per nasally. A diagrammatic scheme or outline of the right and left images was shown, together with the findings of the stream of pus from the antrum."—*Journal of Laryngology & Otolaryngology*, September, 1929.

PRICE, complete in case with spare lamp, £7/18/6. Rubber stamp for case book, 6/6

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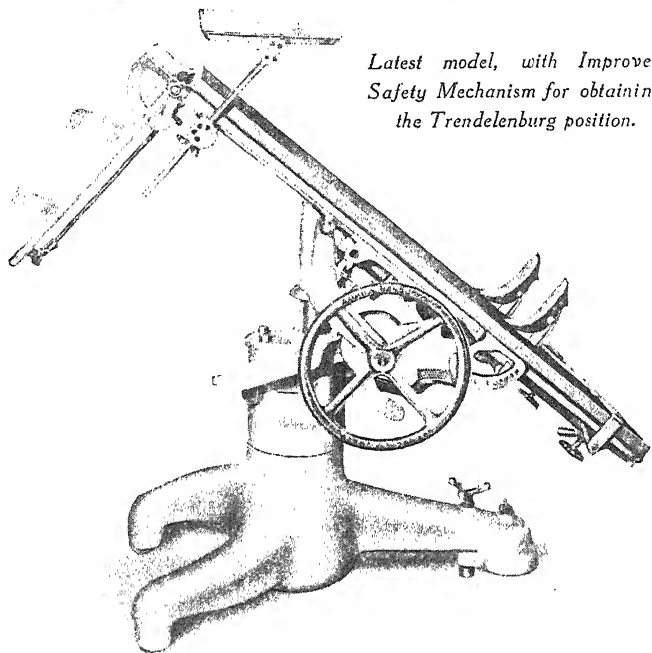
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Telephone:
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Telegrams:
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St. Bartholomew's Hospital Operation Table



*Latest model, with Improved
Safety Mechanism for obtaining
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This table is used throughout St. Bartholomew's Hospital and in over six hundred other hospitals in all parts of the world. A hydraulic oil pump, worked by a pedal lever enables the heaviest of patients to be easily raised and lowered. The whole table top can be rotated freely on the base. Two heavy ball-bearing wheels at one end and a rotary ball-bearing castor at the other end, permit of its being easily moved from the anæsthetic room to the theatre. The head and leg flaps can be adjusted to any angle by means of the fine adjustment, spring lever and quadrant action, which eliminates any possibility of injury to the fingers.

A Children's Model can now be supplied.

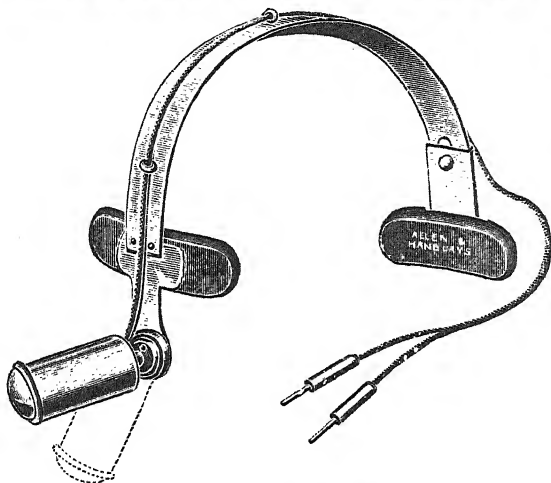
Illustrated booklet giving full particulars will be sent on application.

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THE "OSLITE" Improved Electric Forehead Light



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Weight 5 oz.

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**Price
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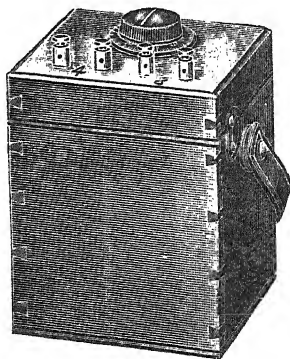
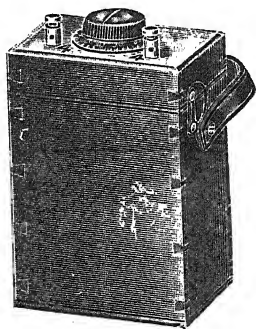
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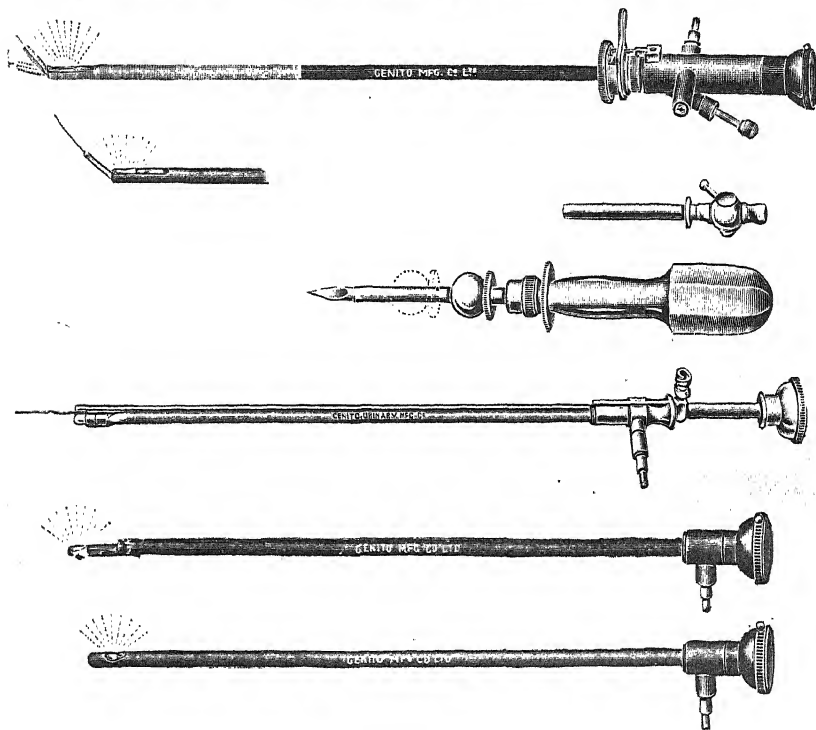
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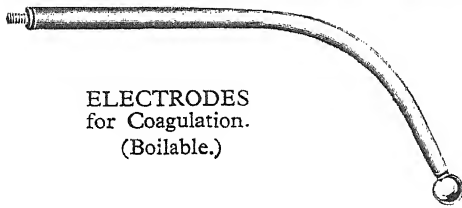
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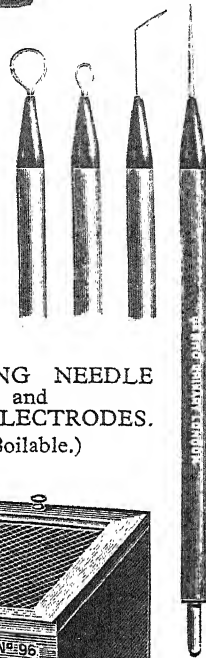
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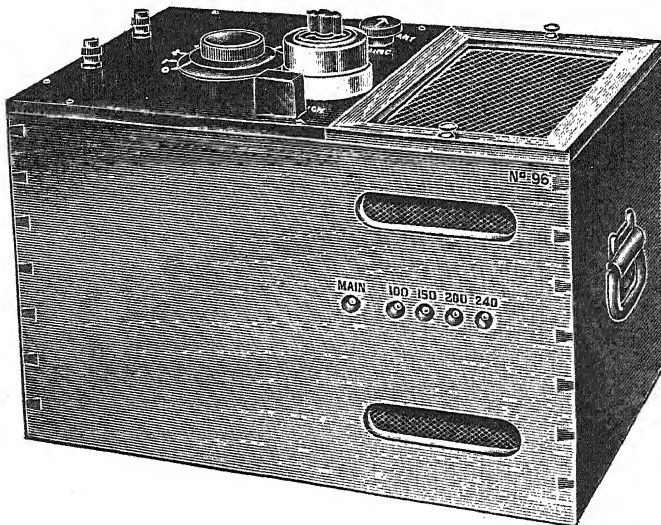
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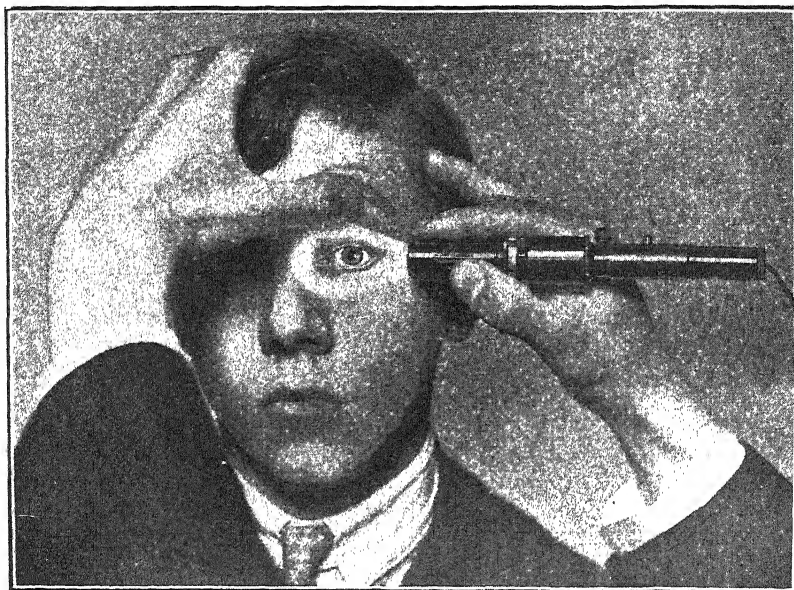
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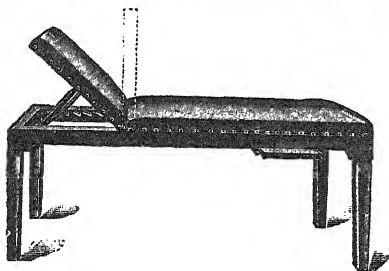
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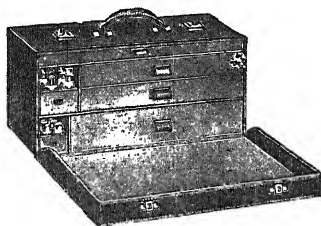
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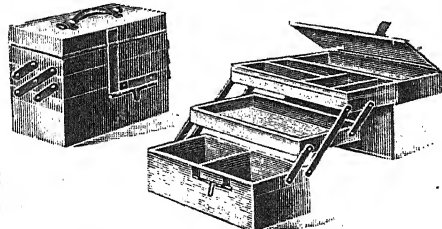
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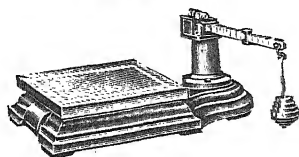


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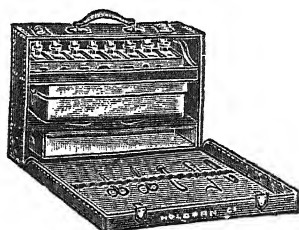


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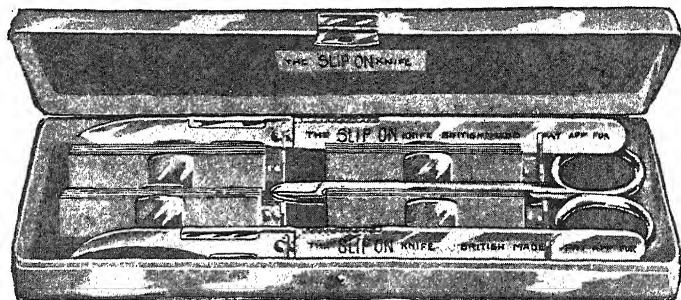
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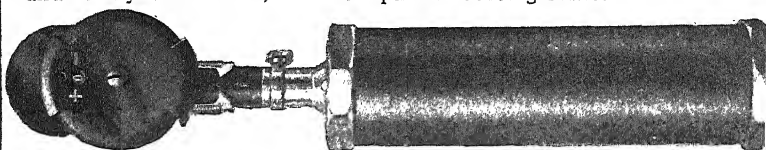
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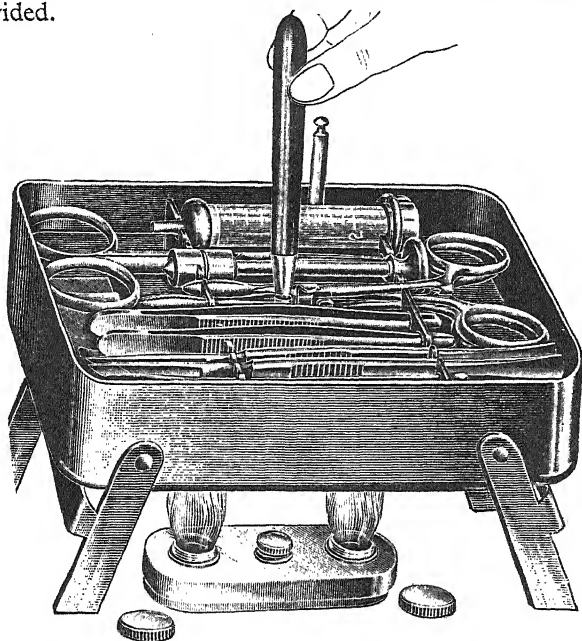
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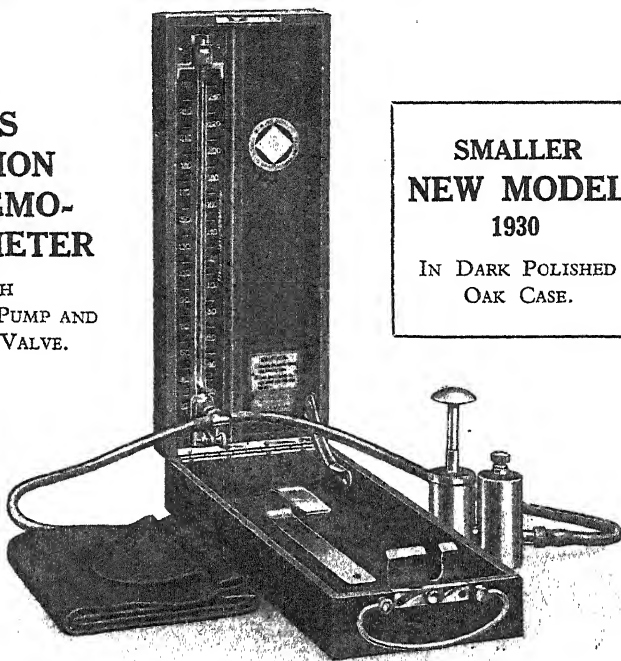
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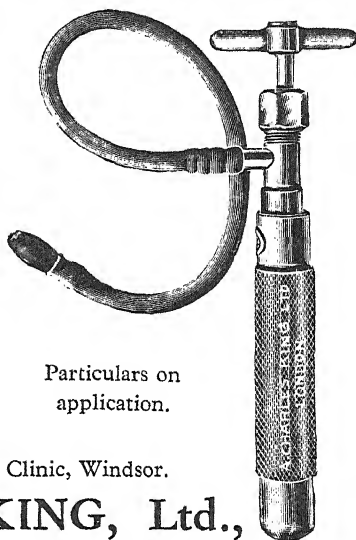
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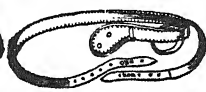
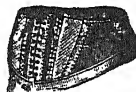
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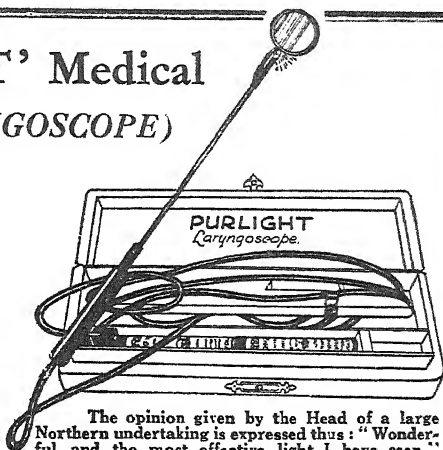
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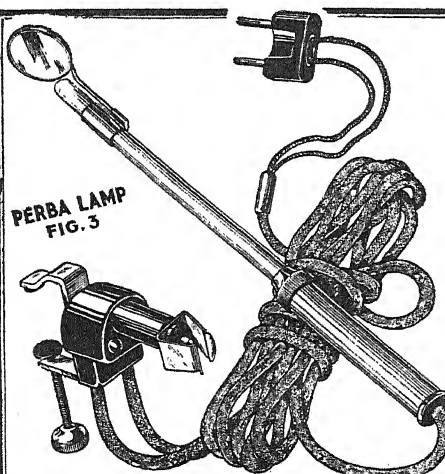
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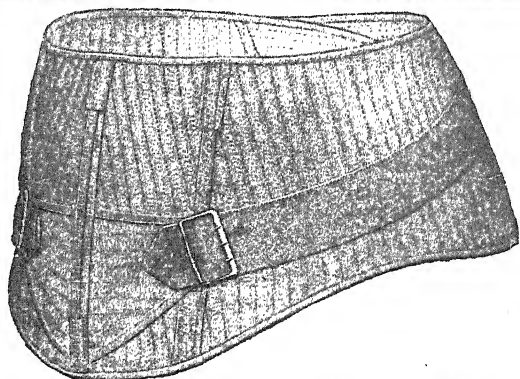
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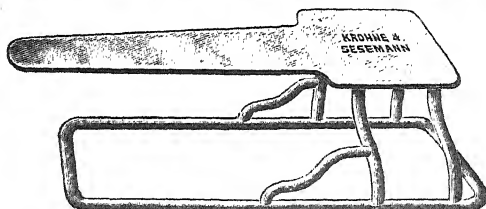
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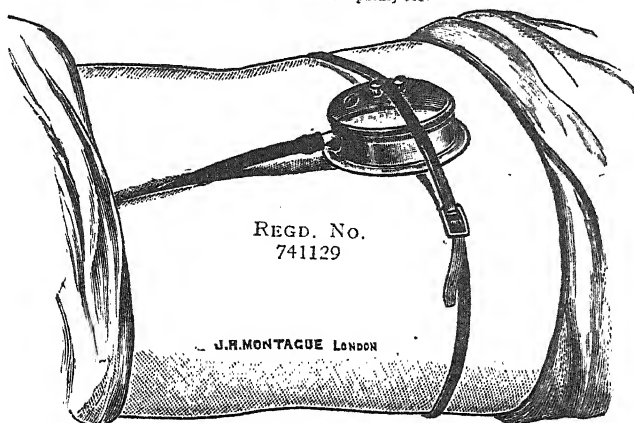
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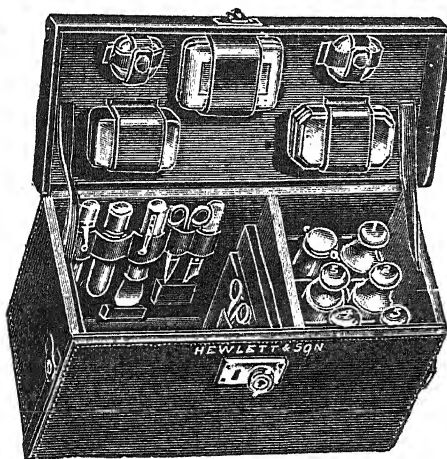
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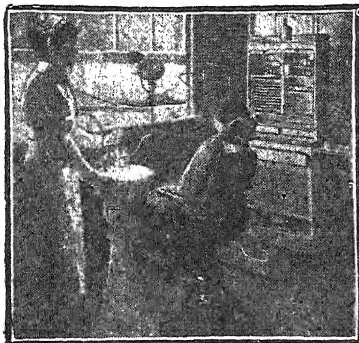
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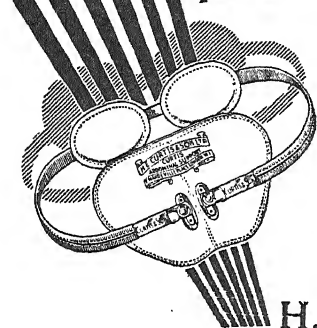
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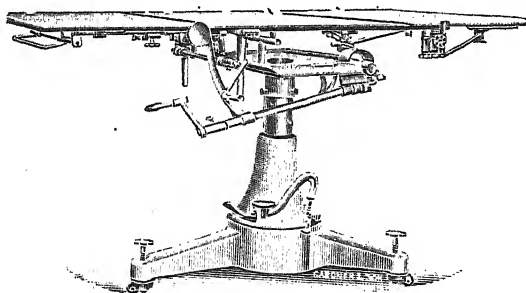
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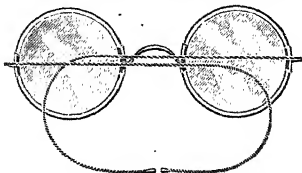
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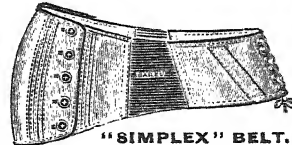
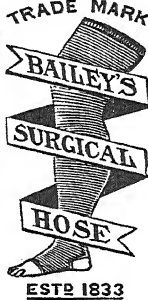
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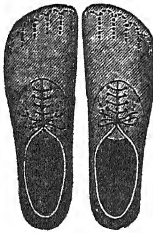


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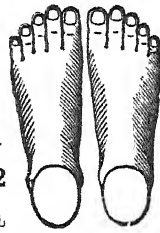
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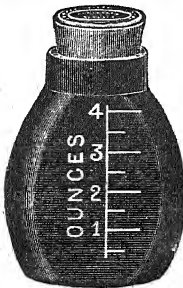
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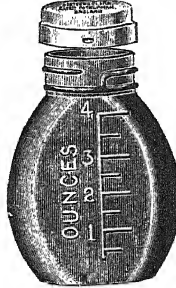
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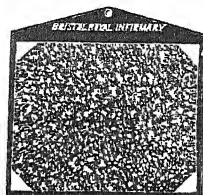
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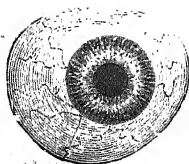
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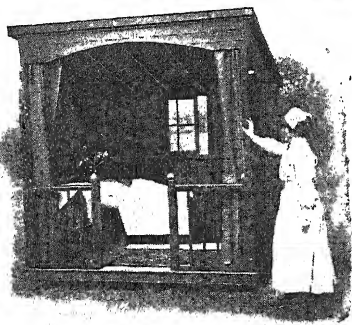
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INDEX.

| | |
|---|---|
| Accountancy .. 32 | Locums & Trans- fers (Agents) .. 29 |
| Births Notifica- tion 17 | Massage 37 |
| Births Registra- tion 16 | Maternity Welfare 36 |
| Blood Transfu- sion 30 | Medical Defence Societies 31 |
| Certificates and Coroners .. 17 | Metric System Conversion Tables .. 24-25 |
| Child Welfare .. 36 | Miscellaneous Useful Addresses .. 37 |
| Cod Liver Oil (New Therapeu- tics of) .. 5-13 | National Health Insurance .. 38-41 |
| Composition of Foods 26 | Obstetrical Table 23 |
| Consultants (Borough and County) 29 | Pathological Speci- mens by Post 43 |
| Cremation 30 | Percentage Solu- tions 22 |
| Dangerous Drugs Act 20-21 | Postal Informa- tion 42 |
| Deaths (registra- tion of) 16 | Proportionate Doses 22 |
| Debts Collecting 32 | Radium Treat- ment 31 |
| Dentition (Cod Liver Oil in) 10-12 | Rate of Pulse .. 16 |
| Digestion of Foods 26 | Teething Table.. 15 |
| Embalming.. .. 31 | Telegraphic Ad- dresses 3 |
| Factory Diseases 20 | Telephone Num- bers 4 |
| Food and Milk Grants 36 | Thermometer Comparisons .. 27 |
| Gymnastics (Medical) 37 | Tuberculosis (Notification & Fees) 19 |
| Hospital Letters 36 | Weight & Height of Babies .. 14 |
| Income Tax .. 32 | Weight & Height of Children .. 14 |
| Incompatibles 32-35 | Weight & Height of Adults .. 15 |
| Infectious Diseases (Incubation, Quarantine and Isolation) .. 18 | Wills 28 |
| Infectious Diseases (Notification) .. 18 | |

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